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TEXTILE WORLD RECORD

A JOURNAL FOR MANUFACTURERS AND ALL OTHERS INTERESTED IN THE PROCESSES AND PRODUCTS OF TEXTILE MANUFACTURING

LORD & NAGLE COMPANY BOSTON MASS.

Table of Contents Page 63 Buyers Index Page 163 Index to Advertisements Page 173

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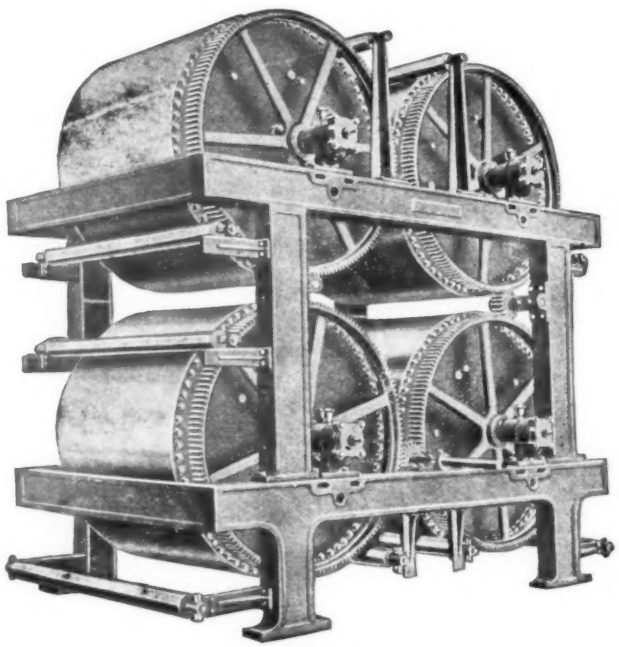

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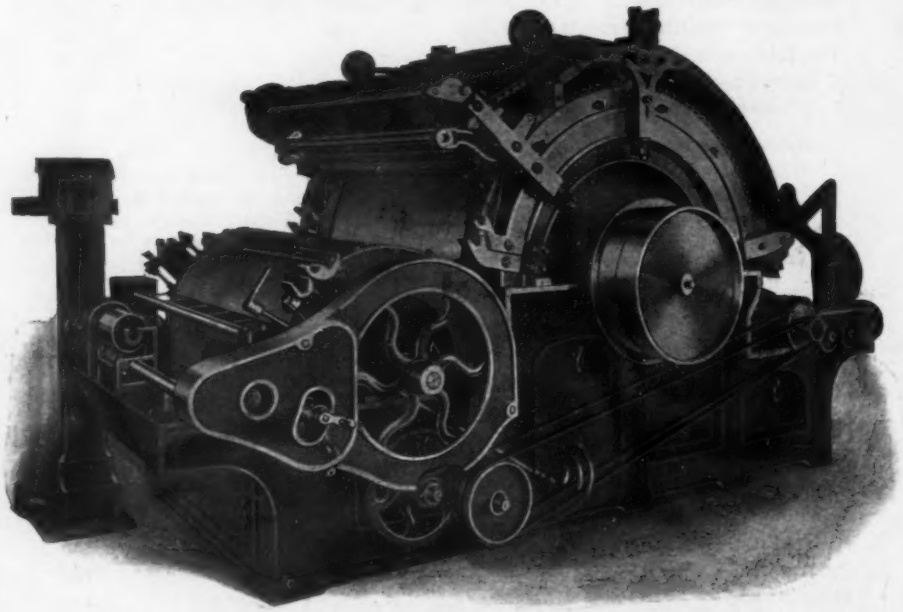
Contents for November

	PAGE
Monthly Comment	65
The Knit Goods Convention and Exhibition	68
"Imported" Woolens	68
A Misleading Comparison	70
Woolen and Worsted	72
Testing of Shrinkage for Wool	75
The International Smoke Abatement	76
A Government Spinning Mill	79
The Permutit Process for Softening Water	83
CORRESPONDENCE AND NOTES	86
The Development of the Dabbing Motion—A Slub Detector for Spoolers—Nub Effects and How to Produce Them—An English Mill Chimney—A Hand Book of Weaves—Preventing Double Threads in Spinning—English Notes—Increased Efficiency by Elimination of Useless Motions—A New Storehouse for Cotton—A Feed Knife Regulator for Noble Combs.	
QUESTIONS AND ANSWERS	104
KNITTING DEPARTMENT	110
The Knit Situation—Plating on Latch Needles—Three New Necktie Machines—Knitted Braids—A Special Basket for Hosiery Mills—Knitting Memoirs—An Improved Sewing Machine for Knitting Mills.	
DYEING, BLEACHING, FINISHING, ETC.	120
Bleaching Cotton—The Permanent Fireproofing of Cotton Goods—Fast Colors—Dye Recipes.	
NEW MACHINERY AND PROCESSES	130
PERSONALS	139
MILL NEWS	144
NEW PUBLICATIONS	152
BUSINESS LITERATURE	152
INDUSTRIAL NOTES	153
RECENT TEXTILE PATENTS	160
PUBLISHERS' PAGE	176
WOOL MARKET	191
BRADFORD MARKET	193
COTTON MARKET	195
YARN MARKET	197
RAG AND SHODDY MARKET	207
SILK MARKET	209
DYESTUFFS AND CHEMICALS	213
MILL STOCKS	217

Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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TEXTILE WORLD RECORD

NOVEMBER, 1912

Monthly Comment.

The Textile Industry and the Election

The election of a Democratic President and Congress is an event of great importance to the textile industry. The textile tariff will be revised, and legislation affecting corporations will be enacted. But the political changes come at a particularly favorable time. Business is good throughout the world. The trade has for months looked upon the result of the election as a foregone conclusion, and has had time to prepare for the change. Moreover the cause of protection is by no means in such a desperate plight as the platform of the victorious party would indicate. President-elect Wilson made it plain during the campaign that he intended to propose nothing injurious to American enterprise, and that, while a revision of the tariff by his party would be downward revision, the changes would be made gradually and guided by the best information attainable. Added to this is the probability that the country will not be subjected to the disturbance of a general revision of the entire tariff, but that the revision will be accomplished schedule by schedule. Under such conditions it is the duty of protectionists to avoid mere factions' opposition to the new President and Congress, and to cooperate with these new servants of the people, whose leader has promised to invite cooperation. This is the course most likely to prevent serious mistakes in legislation.

American Goods Sold as Domestic

The statements made by a wool manufacturer to the "Daily Trade Record" and which will be found in this issue, call attention to a very prevalent method of deceiving the public by selling as imported, wool goods made in American mills. Domestic manufacturers of medium and fine woolens and worsteds frequently find their goods offered to the consumer as imported, and every one who buys wool goods from retailers is constantly greeted with the words, "This is imported," generally spoken in a hushed tone to impress the prospective purchaser with the merits which imported fabrics alone possess. It is, of course impossible, for the American manufacturer to sell his goods as imported, so that the deception when it does exist, must originate with the jobber, clothing manufacturer, retailer or tailor. The misrepresentation is prompted by the fact that it is easier to sell goods when the buyer believes them to be imported. This prejudice in favor of imported woolens and worsted is found to a greater or less degree in every country, but in the United States it is encouraged by the fact that only the high grade wool goods can be imported. The low-priced fabrics are excluded, and under these conditions the human trait of preferring foreign goods is abnormally developed.

The truth is, however, that the poorest

trash made on earth and called wool goods is made outside of the United States. If anyone who reads these lines doubts the statement we invite him to call at our Boston office and examine several hundred medium and heavy weight samples of English woolens and worsteds for men's wear, ranging in price from 14 cents to 60 cents a yard 54 inches wide, which we obtained from Yorkshire, about a year ago. They represent the highest development in the art of making wool goods from mixtures of shoddy and cotton. Some of them are serviceable and attractive fabrics, but many are properly classed as trash. Such goods never reach the American market, and as a result all the low grade woolens offered to the American consumer are of American manufacture.

The popular prejudice against domestic wool goods is thus developed to an extraordinary degree, and constitutes a serious burden on American wool manufacturers. Removing this prejudice is by no means an easy task, but it is for the interest of both manufacturer and consumer to have it removed. Twenty-five years ago Great Britain sought to correct similar evils by means of the Merchandise Marks Act, which required that imported goods bearing words in English language should be marked with the country of origin. The unexpected result of this law was to give German goods an unprecedented advertisement by means of the label "Made in Germany." The underlying principle of the English law is, however, the prevention of deception, and statesmen who, like the Hon. Victor Murdock, have wasted their time in framing bills that required manufacturers and government officials to accomplish the impossible, might profitably direct their efforts toward framing a Merchandise Marks Act for the United States, that would possess the good features of the British act, while avoiding its defects.

The Trade with Chemnitz

The American consul at Chemnitz sends us the following statement of the exports of gloves, hosiery and underwear from his consular district to the United States for the three months ending September, 1911 and 1912:

	GLOVES	HOSIERY	UNDERWEAR
COTTON 1911:			
Quantity, dozen	272,681	448,545	4,470
Value per dozen	$1.44	$1.43	$4.20
Total value	$391,468	$638,317	$18,789
1912:			
Quantity, dozen	377,569	449,368	4,409
Value per dozen	$1.39	$1.47	$4.63
Total value	$524,929	$659,966	$20,427
SILK 1911:			
Quantity, dozen	6,951	5,323	257
Value per dozen	$2.36	$3.25	$14.25
Total value	$16,373	$17,274	$3,663
1912:			
Quantity, dozen	4,272	9,809	314
Value per dozen	$2.35	$2.14	$15.30
Total value	$10,039	$20,955	$4,803
WOOLEN 1911:			
Quantity, dozen	43,354	5,735	1,837
Value per dozen	$1.13	$2.00	$6.37
Total value	$49,874	$11,445	$11,704
1912:			
Quantity, dozen	46,887	6,455	2,477
Value per dozen	$1.26	$2.11	$5.20
Total value	$59,308	$13,609	$12,875

An Improved Method of Ginning and Baling Cotton

So much has been talked and written about the bad baling of American cotton that it is particularly gratifying to be able to call attention to the good baling of that commodity. On Nov. 2 there arrived in Boston a carload of cotton ginned and baled by the Modern Gin and Compress Co., of Little Rock, Ark. Although this was the first shipment to New England, this company has been exporting cotton ginned and baled by the new method for a year or more, so that the lot that reached Boston represents, not an experiment, but an improvement that has reached an advanced stage of development.

The cotton is baled and compressed at the gin into bales two feet square and four feet long to a density of 32 pounds per cubic foot or 528 pounds to the bale. The bale is covered with bagging of uniform weight cut to the exact size required, and fastened with six bands. The bagging and ties weigh eleven pounds. The bales are all of the same size, any difference in their weight being due to a difference in the density of the baled cotton. One hundred of these

bales can be loaded in a freight car of standard size, 34 feet long; and one hundred and fifty bales, in a forty-foot car. The samples are drawn from the center of the bale while the cotton is being baled. Six thousand of these bales were shipped to market during the past cotton season, and we are informed that the reclaim charges on the six thousand bales amounted to $3.18. The cotton has been carried by the railroads from points in Missouri and Arkansas to the seaboard in four car service days, with 100 bales to the carload. The old style bales are loaded 25 bales in a car at the gin, transported to the compress, then loaded 50 bales in a car and carried to the seaboard, time consumed being from 20 to 30 days.

The new method has been developed quietly and those in control of it plan to have it work its own way into the favor of the trade by reason of the economy in transportation and the excellent condition in which the cotton reaches the mills.

Textile Machine Works Merger

The merger of the Saco-Pettee Company and the Lowell Machine Shop, which was announced last month, brings together two of the largest builders of textile machinery into one big organization with four separate plants.

The Lowell Machine Shop controls the Kitson Shop at Lowell and the Saco-Pettee Company has large plants at Newton Upper Falls, Mass. and Biddeford, Me. The machinery which the consolidated company builds includes practically a full line of manufacturing equipment for the cotton and worsted industries.

The new company will be known as the Saco-Lowell Shops and the general executive offices will, after January, 1913, be located in the new Columbian National Life Insurance Company's building on Franklin St., Boston. Temporarily their headquarters are in the First National Bank Bldg., 60 Federal St., Boston. The officers of the new company are: President, Henry S. Shaw; Chairman of the Board of Directors, Robert F. Herrick; Treasurer, R. P. Snelling; General Agent, Frank J. Hale; Vice President, James C. Howe.

Mill Stocks of Cotton

The International Cotton Federation's report of mill stocks of raw cotton on Aug. 31, 1912, covers 90 per cent. of the 140,693,103 cotton spindles in all countries. This is a most gratifying exhibit and shows that the cotton spinners of the world recognize the value of the Federation's statistical work and have entire confidence in the manner in which the returns are tabulated. The number of spindles not covered by the report, although small when rated by percentage, reaches the respectable total of 13,955,971. This should stimulate the Federation in an effort to reach the 100 per cent. mark, which has already been attained in the case of Austria, Belgium, Holland, Denmark, Norway and the United States. The spindles not included in the returns are distributed as follows:

Great Britain	6,583,138
Brazil and Mexico	2,302,380
India	1,779,626
Russia	1,030,093
Italy	956,936
Spain	300,000
France	253,190
Spain	165,121
Germany	163,650
Sweden	151,680
Switzerland	123,210
Canada	76,947
Portugal	70,000
	13,955,971

The stocks and consumption of cotton as reported semi-annually by the Federation for foreign mills since the statistical work was started in 1905, are as follows:

STOCKS AT FOREIGN MILLS

Date.	Returns, Spindles.	Bales on hand.	Bales used per week.	Stocks will last
Aug. 31, '05	46,726,929	935,237	103,269	9 weeks
Mar. 1, '06	54,297,537	1,237,180		
Aug. 31, '06	66,072,303	1,210,610	145,603	8.3 weeks
Mar. 1, '07	71,054,503	1,911,071		
Aug. 31, '07	74,279,078	2,368,410	190,811	12.4 weeks
Mar. 1, '08	78,984,106	2,342,127		
Aug. 31, '08	83,371,883	2,132,045	215,472	9.9 weeks
Mar. 1, '09	85,906,697	2,425,127		
Aug. 31, '09	88,188,004	2,275,392	222,740	10.2 weeks
Mar. 1, '10	91,154,411	2,492,688		
Aug. 31, '10	91,124,025	2,005,786	236,990	8.4 weeks
Mar. 1, '11	93,726,091	2,641,688		
Aug. 31. '11	92,405,197	2,096,052	252,365	8.3 weeks
Mar. 1. '12	94,041,529	2,657,413		
Aug. 31, '12	96,424,132	2,998,540	278,142	10.8 weeks

The figures for the United States, which have been supplied to the Federation by the Bureau of the Census, are as follows:

STOCKS AT AMERICAN MILLS

Date	Returns, Spindles.	Bales on hand.	Bales used per week.	Stocks will last
Aug. 31, '05	23,687,495	776,801	82,288	9.4 weeks
Aug. 31, '06	25,250,096	688,312	94,413	7.3 weeks
Aug. 31, '07	26,242,000	996,000	95,904	10.4 weeks
Mar. 1, '08 est.	27,000,000	1,089,119		
Aug. 31, '08	27,846,000	596,000	87,981	6.4 weeks
Mar. 1, '09	27,846,000	1,831,800		
Aug. 31, '09	27,783,000	908,000	97,788	9.3 weeks
Mar. 1, '10	28,000,000	1,674,000		
Aug. 31, '10	28,349,000	518,000	90,519	5.7 weeks
Mar. 1, '11	28,500,000	1,525,000		
Aug. 31, '11	28,872,000	523,000	90,308	5.8 weeks
Mar. 1, '12	29,522,597	1,543,000		
Aug. 31, '12	30,313,000	871,000	103,231	8.4 weeks

According to these figures the stocks at both foreign and American mills were unusually large on Aug. 31, there having been only one date, Aug. 31, 1907, showing a large supply measured by the rate of consumption for foreign mills.

THE KNIT GOODS CONVENTION AND EXHIBITION

The secretary of the National Association of Hosiery and Knit Goods Manufacturers announces that the annual meeting and exhibition will be held in May, 1913, on dates which will be definitely determined later. Notices are being sent to former exhibitors giving them the option of reserving space for next year.

A committee of the exhibitors will confer with the management with the idea of making the exhibition smooth running from the exhibitors' standpoint as well as making it still more attractive for the visitors. It is suggested that the hall should be completely ready for the installation of the exhibits on the Thursday preceding, that is, the platforms, signs, painting and the wiring and all the preliminary work that must be done should be completed before the actual exhibits themselves are moved in and that the power should be ready for connection on Friday morning. Other suggestions at the meeting of exhibitors related to additional service and laborers to take care of the exhibits as they arrive and assist in their setting up.

It is also suggested that the hall should be open from Monday to Saturday inclusive from the hours of 10 a. m. to 10 p. m., but without power during the hours of the convention meeting. Hitherto the exhibition hall has not been open until after the morning session of the convention. If the management accepts the suggestion of the exhibitors, it would permit out of town visitors or those that only have a short time available to visit the exhibition, even if the machinery is not in operation. It is also desired that the exhibits shall be maintained in operation all day Saturday and during the evening to permit the attendance of the overseers and mill help who are an important factor in determining the purchase of equipment and supplies. Other minor matters will be discussed with the idea of making the exhibition of greatest possible interest and value, not only to the visitors, but to the exhibitors and the association.

"IMPORTED" WOOLENS

From Daily Trade Record

A very important factor in the manufacture of cloths for both the men's and women's wear trades, in discussing with a representative of this paper the deception practiced by prominent retailers throughout the United States in substituting domestic fabrics for imported, and the selling of these domestic fabrics as "imported," made the following interesting statement.

He pointed out that it took pretty strong language to emphasize how outrageous this substitution really is. He said that his experience in this question had been very extensive, and that his fights had been very bitter in the protection of his merchandise, or the attempt to protect it and have it sold for what it was.

This authority continued that in the men's custom tailoring business, for instance, the abuse is perhaps more pronounced than elsewhere because invariably the man going to the custom tailor to have a suit made is shown what is represented as "imported" fabrics, and the custom tailor would invariably say: "Now, this is an imported piece of woolen or worsted," as the case might be. He said he had seen his own merchandise displayed in custom tailors' windows in various large cities throughout the country, and upon going in and investigating he had

found that the goods had been sold to the custom tailor as imported by the jobber from whom he purchased them.

This producer said he was convinced that if, in the men's wear lines, the facts were gathered together, it would be found that the cloth really imported into this country for the manufacture of men's suits and overcoats is not a sufficient quantity in a year to make suits for 10,000 men. He continued that all the balance of the stuff sold as "imported," is manufactured by our own mills, and that, as a matter of fact, nobody, including the custom tailor himself, knows whether the goods they sell are imported or made in this country, but simply sell it anyhow as "imported." and therefore, if sold on a quality basis or to a man who is a judge of values in fabrics, the domestic goods would be purchased just as readily, if not more so, than the actual imported.

He then cited a case of where in his mills he had manufactured a cloth which he took to a custom tailor to have made up into a frock coat. His tailor looked at it, and said: "It is the most beautiful piece of cloth I have ever seen in my business experience. Surely, this is the one time that you have brought to me a piece of cloth that has not been made in your mills. No domestic manufacturer could produce such a wonderful fabric."

The mill man assured the tailor that the goods had been made in his own mills, and he then selected one of the finest pieces of worsted the tailor had in his shop, and asked: "How much do you pay for this cloth?" The tailor replied: "$3.50 a yard." This domestic mill man then said: "I will sell you this piece of cloth made in my mills, that you say is the finest you have ever seen, for $3 a yard."

The mill man then commented upon how few judges there really are of values, and how little even people in the men's wear trades know, and how fascinating the word "imported" has been made to so many people.

He went on to explain a case, in the women's wear lines, of how he had tried repeatedly to identify his goods through some trade mark or label or ticket, and how the jobbers and big retailers throughout the country had positively declined to touch his merchandise if the name or identification mark appeared anywhere on the fabric. He said that some time afterward he had taken the opportunity of pasting on the cloth-board the label of the mill, and the goods had been shipped out. It took two months before, through distribution in the usual channels, the jobber to the retailer and the retailer perhaps to the ladies' tailor, this label was discovered on the boards. But eventually he received a letter from a very prominent women's tailor in one of the large cities in the United States, stating that they had purchased the goods as imported, and expressing their surprise and astonishment that the goods had really been made by an American mill. This women's tailor is one of the finest in the United States, and was anxious to duplicate, buying another piece, but by the time he had used the merchandise the mill had discontinued the manufacture of this fabric, and consequently did not have another piece in stock, and probably would not have sold it if they had, direct to the cutter-up.

Then he had other instances of this kind, and an avalanche of protests from jobbers and retailers who discovered this identification mark after the fabrics had been sold as "imported." The attempt to identify the cloth resulted in such a bitter fight that the mill was compelled, not only to leave all marks off the fabrics and the board, but in no way to even mark or identify the shipping case, so that when the goods were received there was simply a code word or a number on each case that the manager could translate, so as to know where the fabrics came from, and check them from this code word or number, and in that way know where the goods come from. This was done so that even the porter who unloaded the car would not know where this merchandise had come from.

This mill man stated that if it had not been for his selling organization, and for the men connected with it, who had built up an enormous following and were dependent upon

the mills' action for their income and future, he would have sacrificed his profits and fought the thing out to the bitter end, and have insisted that his goods be sold as American, domestic, and an identification mark be put on them, or the business be declined.

He continued that many advertising concerns had from time to time approached him with the idea of advertising and promoting his merchandise through a brand or trademark, but that no logical, workable plan had ever been suggested to him, where this could be done right. The only approach to it was where a manufacturer of cloth would make the goods up into finished garments, and in that way, through labels and indentification marks, guarantee both the fabric and the workmanship of the garment, but this, he said, is undesirable because the mill man would then become a manufacturer and cutter-up and would have to handle two lines of trade.

In conclusion this important mill man stated that he did not believe the retailer lived who is not "today practicing this deception, and selling in large quantities, domestic goods as imported."

—:—

A MISLEADING COMPARISON

Boston, Mass., Nov. 2, 1912.

Editor Textile World Record:

A few weeks ago the Industrial Workers of the World circulated the statement that the average life of manufacturers was 57 years, while that of textile operatives was only 39. This statement should be tabulated in its proper place among the other startling propositions of the syndicalists made to rouse class prejudice, and I want to call attention briefly to the facts in justice to the large number who may take the statement seriously. The comparison of the average age at death of employers and employes is as fallacious as it would be to compare the average age at death of school children and of school teachers. Of course, the average age at death of school children would be lower than of school teachers, because school children are younger than school teachers.

The American Experience Table of Mortality, which is in general use for determining the expectation of life takes under observation 100,000 lives at the age of 10 years. Of these, 999 will die before reaching the age of 11, and so on in corresponding ratio, until at the age of 65, but 50,000 are living. Therefore, the age of 65 is the breaking point, where the number of decedents equal the number living, and may be taken as the average lifetime. The experience of the nation, or of a large community, will closely follow this law of average, but deductions cannot be properly drawn from the experience of a very small community, as a slight divergence from this law of average would very naturally be caused by some local condition, which would not affect the State as a whole. The student of vital statistics must move very cautiously in drawing conclusions from a high death rate, or a low average age at death, as there are so many factors that he is liable to make serious errors.

Of late years there has been some very valuable work done on this line, resulting in beneficial legislation in many instances, but as yet the data at hand are not sufficient to lay down a definite law of life. Their value is mainly comparative, and if in any specific industry an abnormal number of deaths occur at a given age or from a given disease, there will be the basis for careful investigation to demonstrate the cause.

As the article above referred to Lawrence, the following incident may be of interest. Years ago the death rate of Lawrence was abnormally high. Contagious diseases were prevalent. The heavy percentage of death losses in the city incurred by life insurance companies caused serious comment, and much blame was laid to conditions attending the work in the textile mills. The death rate of Lawrence in 1890 was 27.8. In 1893 the city improved its water supply, and in 1900 the rate had dropped to 20.2. In 1905 it was 16.0; in 1910, 17.7. In this case the heavy mortality among the operatives lay in a bad water supply, which reacted on them through their inability to protect themselves

In considering the effect of industrial conditions upon the body there are many points

to be taken into consideration. The nationality, age, sex, salary earned, condition of home life and its bearing upon the occupation, as well as the care of health and sanitary provisions. These points cover too large a field to give the necessary detail here, but the point may best be explained by a quotation from the report of the Massachusetts State Board of Health to the Legislature dated January 12, 1905, which states in part: "Due weight must be given to the fact that, while certain occupations are open only to the strong, others are the refuge of the weak. The extramural conditions also are of the highest importance whatever the nature of the calling. In the same line of work those who are properly housed, fed and clothed, and whose mode of life is marked by temperance in all things which may influence health, will show a smaller percentage of sickness, a lower death rate and a higher average age at death than among those whose home surroundings are inferior and whose lives are marked by vicious excesses. Again, age is an important factor. In certain lines of industry that offer but a low wage, it is largely the very young, not yet arrived at full development, who respond to the call, and if the particular industry is one of those classed as dangerous, the inevitable result of non-observance or non-provision of necessary hygienic precautions is a high rate of morbidity and mortality and a low average age at death."

According to the U. S. census over 80 per cent. of the operatives in the textile industry are under 45 years of age. Figures from another source show 57 per cent. under 25 years of age, and the average age of the operatives to be 26. Therefore the decedents of this special class must of necessity show a low average age, but it would be an error to assume that because a given number of the hundreds of thousands of textile operatives die young, the average lifetime of this large class has departed from the law of life to a corresponding degree.

The statement in regard to the more favorable experience of manufacturers does not mean anything. In the natural course of events, a young man enters business and in his maturer years he will be at the head of his establishment in some capacity. He has advanced and is called the "manufacturer." If under these conditions the average age of manufacturers at death is 57, it does not discredit the law of averages.

The figures of the average lifetime of a special class are of no value, and to show the fallacy of the I. W. W. statement the following comparative record of death rates is submitted: The Census of 1900 gives the general death rate for the registration area at 17.8; for the occupied males in the registration area as 15. It reports the death rate for mill operatives (male) as 8.8, and females 4. In explanation it states that this remarkably low death rate for mill operatives is largely due to the fact that the operatives are of the younger ages, over 80 per cent. being under 45 years of age.

Daniel S. Pratt, Jr.

WOOLEN AND WORSTED

BY PROF. ROBERTS BEAUMONT

In Journal of the Leeds University

Woolen yarns comprise the pure Saxony, the pure cheviot, and yarns produced from wool substitutes of similar characteristics, but of inferior quality. Both the cheviot and the Saxony may be spun on the self-actor, that is, by means of spindle drafting; or on the "continuous" frame by roller drafting, due to using pairs of rollers accelerating in speed from the back to the front pair of rollers. On the self-actor—the older type of machine—the process of spinning is compound. A length of thick, fluffy, condensed thread is first delivered, a degree of twine inserted, followed by a cessation of the delivery rollers, with a continuance of the outward traverse of the carriage—effecting the drafting or attenuation of the thread—when, finally, the carriage, having reached its maximum run, the spindles insert the twist or twine and produce the yarn.

Obviously, the principle is very different from that of spinning on the continuous frame, in which the spindles are fixed and have one constant speed [in mule spinning they have three speeds—(1) during drafting; (2) in twisting; and (3) in winding up the

yarn], the yarn being delivered continuously by the drafting rollers, and also wound on to the bobbins or cops. Drafting and spinning are thus done at one operation. Mechanically, the system possesses some of the features of frame spinning for worsted and cotton yarns; but here there are several drawing boxes, in each of which doubling and drafting—and may be a slight degree of twisting—are practised, until a thread of suitable diameter and regularity of structure may be formed in the process of roving.

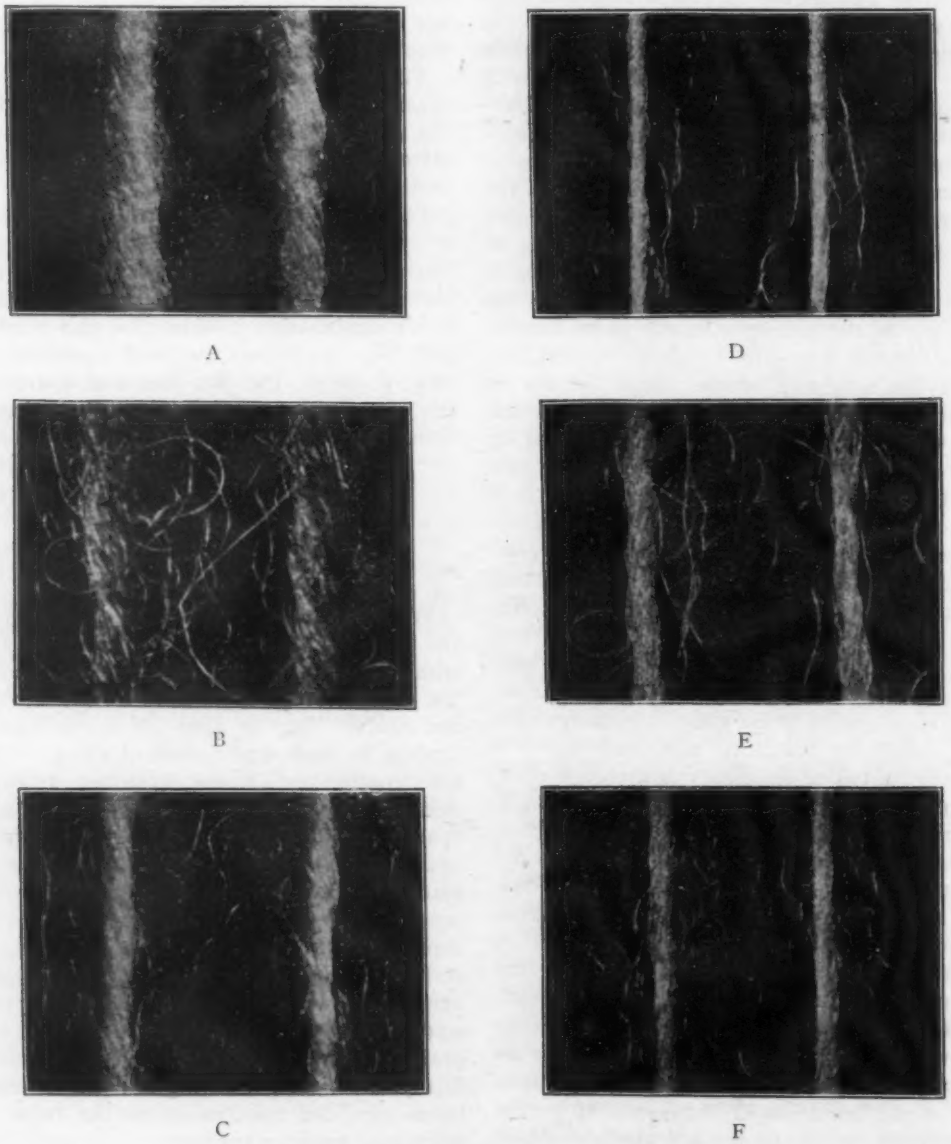


PHOTO-MICROGRAPHIC ILLUSTRATIONS OF WOOLEN AND WORSTED YARN

(A) Saxony woolen (mule spun).
(B) Cheviot woolen (mule spun).
(C) Cheviot woolen (frame spun).
(D) Botany worsted (cap spun).
(E) Crossbred worsted (cap spun).
(F) Botany worsted (mule spun).

The soft thread, thus obtained, is still further drafted on the spinning frame before the real and final twist is introduced—which makes it a weavable yarn—as it passes from the front pair of rollers to the spindles. An essential difference, therefore, between frame-spun worsted yarn and the continuous-spun woolen yarn, is that the former is a multiple or series of preparatory but similar processes plus spinning, and the latter a simple routine of work, converting, at one operation, the untwisted condenser sliver into a firm, spun thread.

The older system produces a yarn of a rougher nature (A and B), with the fiber clustered, meshed, and in a medley but compact relation with each other, than the yarn spun on the more modern system (C), the chief characteristics of which are comparative straightness and evenness, or a thread somewhat allied to the worsted structure (Plate II., D, E, and F).

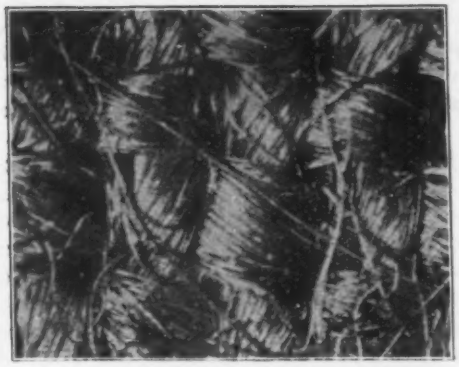
Worsted yarns comprise two great types, Botany and Crossbred. (D and E, Plate II.) On the English system, the first and simplest type is due to carding, backwashing, drawing, and spinning; the second, and ordinary type for short wools, to carding, backwashing, combing, drawing, and spinning; and the third type, for long-stapled wools, to preparing by gill-boxes, combing, drawing, roving, and spinning. On the Continental system, the routine—short-stapled wools—is carding, combing, backwashing, drawing, and spinning, with essential differences from the English method: (1) for straightening and leveling the fibers in drawing; and (2) in spinning, which is done on the self-actor and mainly by "roller" drafting.

Each class of yarn possesses a distinct structure. The first English system produces a yarn resembling in a degree a woolen thread, on account of the absence of combing from the processes of construction—the short fibers remaining in the spun yarn. By the second system (D and E, Plate II.) the typical Botany and Crossbred yarns for coatings, suitings, dress and costume fabrics are acquired, and should be level, smooth, and of a bright quality, especially when made of fine wools. The true lustrous "worsted" is made by the third routine or gill-box preparation. The Continental system yields a yarn of a more foody character, softer in structure, than that obtainable on the English scheme of manufacture (F, Plate II.).

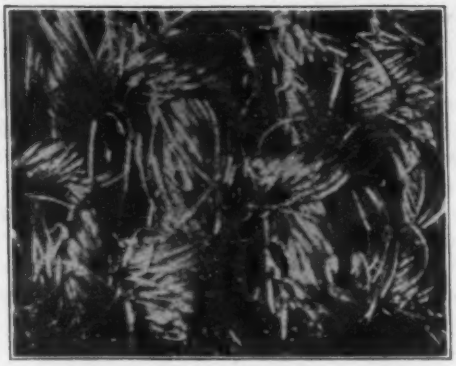
An interesting feature of the dissimilarity in the construction of woolen and worsted yarns obtains in the methods of mixing or blending of the fibers of different qualities or colors. In making woolen yarn the batches of wools of the several colors are primarily mixed by bedding in layers, then teazing, a process which leaves the materials blended, but in tufts of fibers. Scribbling and carding follow, by which compound operation the fibers are separated and combed from one another, but thoroughly mixed into a homogeneous state by frequently changing positions on the wire teeth of the workers, strippers, and cylinders. After this stage, there is little further mixing effected, because condensing simply divides the sheet of filaments so blended into lengths of sliver; and twisting follows without altering the relation of the fibers to each other, beyond importing a degree of displacement of fibers in drafting which forms a part of the spinning operation.

In making worsted yarn, blending may, in the first place, be done by recombing; but a more general method is to "mix" in the gill boxes, continuing the work and producing at each stage a more perfect mixing in the several drawing boxes employed. Whichever system is practiced, the blending of the fibers transpires while they are in a line with each other, straight and uniform in arrangement and grouping, and not while crossed and intermingled in every variety of direction, as on the woolen system.

Only the briefest comparisons can be made here of the texture and structural character of the woven fabrics, and these confined to the illustrations given on Plate III., Patterns A, B, C, D, E, and F. First, note the difference between the plain weave textures, A and B.; the worsted (A) is clearer on the surface, though treated in the same manner as the woolen in finishing, the fibers of the threads, whether warp or weft, being



A



B

C

D

E

F

(A) Worsted texture, plain weave.
(C) Worsted texture, twill derivation.
(E) Donegal Tweed, twill weave

(B) Woolen texture, plain weave.
(D) Woolen texture, twill derivation.
(F) Welch woolen, costume fabric.

more regularly twisted, and straighter in arrangement. The same characteristics are present in the fancy weave fabrics, C and D, but if anything more marked. Both examples are in crossbred wools, but had Saxony yarns been used for the woolen, and botany yarns for the worsted, the contrast would have been equally pronounced and distinct.

The utility of these microscopic illustrations consists in the well-defined dissections they afford of the yarn and fabric structures. That the worsted should be clearer, brighter, and smarter than the woolen is understood, but that the difference should be so marked as between A and B, and C and D, Plate III., is not so apparent from an ordinary examination of the fabrics. The method of fiber grouping practised in yarn manufacture is distinctly developed. No theoretical explanation is needed of the cause of the woolen thread of a given diameter possessing a higher percentage of fiber than the worsted. It is clearly traceable in these magnified textures; and, also, how such fibers affect the density, closeness, and aspect of the woolen fabric. On the other hand, the leading features of the worsted yarn, and their influence on the character of the texture are equally pronounced—they emphasize the interlacings of the weave construction. (Compare A and B, and C and D.)

Moreover, in fabrics of the same yarn structure—woolen or worsted—elements of dissimilarity may be present, as seen in E and F, Plate III., the former a Donegal tweed, twill weave, and the latter a Welsh costume fabric, plain weave. In each the strong fibers appear to have resisted the twisting process in spinning and project in wild form from the thread proper, but in the Welsh texture they are also spread and crossed in all fashions, effectively concealing the interlacings of the warp and weft.

The results of experiment and practice, which have demonstrated the causes of the nature of the difference in appearance, wearing quality, and styles of fabric obtained from cheviot and Saxony, and crossbred and botany yarns, are thus verified by microscopic research.

TESTING THE SHRINKAGE OF WOOL

East Las Vegas, New Mexico.
Oct. 27, 1912.

Editor Textile World Record:

I was very much interested in your reference to Dr. D. E. Douty's article on testing the shrinkage of wool by small samples. My experience has been such that I would not trust any one, not even myself, to make a test of a large lot of grease wool from a small sample. The difficulty arises from the impossibility of getting the small sample to represent the large lot. Testing by small samples may be all right for Cape or Australian wools which contain grease, but very little dirt. Territory wool, however, is filled with loose dirt so that a cloud of dust arises every time a bag of the wool is moved about. It is easy to see how the shrinkage would vary after moving the wool several times. When I buy wool at the beginning of the season I select a number of bags and draw a sample very carefully from each one, then I scour these small samples. After that I take say 30 bags from which the samples have been drawn and scour the wool very carefully. After the wool has been scoured I make sure to remove all of it from the scouring bowls so as to obtain a fair test. After the wool is dry I let it stand for a few hours so as to absorb the normal amount of moisture. Usually I find a difference of 4 per cent. between the shrinkage of the large lot and that of the small lot.

This season I estimated the shrinkage of one lot of 362,000 pounds of wool and the actual results gave me just 255 pounds of clean wool more than I calculated. On another lot I estimated the shrinkage and calculated that I would need five cars for shipping the clean wool. The rules of the Interstate Commerce Commission required that 14,200 pounds shall be placed in each car. The wool was loaded into the five cars as follows: 132 bags, 14,211 pounds; 131 bags, 14,331 pounds; 131 bags, 14,327 pounds; 130 bags, 14,211 pounds; 130 bags, 14,202 pounds. In estimating the shrinkage it is necessary for a man to know the territory from which the wool came and even then his judgment is often inaccurate owing

to the fact that the growers are constantly changing sheep. A sample may be drawn at the ranch, but before it gets to the mill there has been a considerable loss owing to the handling of the bags. In one case I sent large samples to Boston and on testing them one showed a shrinkage of 71 per cent., whereas the large lot shrank only 68 per cent. The test of the sample of another lot resulted in a shrinkage of 68 1/2 per cent., while the entire lot shrank 69.2 per cent. I am unable to see how a chemist can determine the shrinkage of wool as accurately as a man on the ground can. Charles H. Harding told the Ways and Means Committee three years ago that he would not dare go out on the ranch and buy wool.

William White.

THE INTERNATIONAL SMOKE ABATEMENT EXHIBITION

By George H. Perkins, Head of the Engineering Dept. Lowell Textile School.

(Read before the American Society of Mechanical Engineers.)

An international smoke abatement exhibition and conference, under the auspices of the London Coal Smoke Abatement Society, was held at the Royal Agricultural Hall, Islington, London, March 23 to April 4, 1912. The object of the exhibition was to make a comprehensive display of the most approved modern methods and devices for the abatement of coal smoke, applicable either to industrial plants or domestic fires. There were also exhibits showing the injurious effects of smoke deposits upon health, building materials, works of art and vegetable life, with the view of creating an active and intelligent public sentiment on the importance of this widespread nuisance. The educational work was supplemented by a series of conferences which were well attended by official delegates from most of the principal cities of England and Scotland as well as from Germany, Holland, Sweden and other foreign countries.

PRESENT STATUS OF THE SMOKE PROBLEM IN ENGLAND

Smoke has been a recognized nuisance in England for nearly a century. As early as the year 1819, Parliament appointed a committee to investigate this question which reported that effective smoke abatement devices existed and should be used. The public health acts of 1875 and 1891 included sections covering smoke abatement which are the only present laws on the subject. These statutes have not proved satisfactory as they are not sufficiently definite and do not make provision for their proper enforcement. Practically all of the effective work done in abating the smoke nuisance has been accomplished during the past 15 years. The great improvement in atmospheric conditions, as far as London is concerned, has been due principally to the following agencies:

a, The electrification of all of the underground railways formerly operated by coal burning locomotives.

b, The rapid increase in the use of gas appliances for heating and cooking. When authorities agree that more than one-half of London's smoke comes from domestic fires burning soft coal, the following figures are significant:

Year	No. of gas appliances in use
1891	46,000
1896	223,000
1901	445,000
1906	989,000
1911	1,494,000

c, The work of the London Coal Smoke Abatement Society, a voluntary association which has for its objects the following:

1, To aid in enforcing the existing law through the local sanitary authorities, by the employment of inspectors who, after investigation, shall report offenders to the proper officials.

2, To promote and encourage all voluntary efforts to abolish smoke from private dwellings and to investigate the best means for effecting this object.

3, To obtain particulars and evidences of methods of dealing with smoke nuisances at home and abroad.

4, To publish information on matters relating to smoke nuisances, stimulate invention through the offer of prizes and to con-

duct tests on heating, cooking and stoking apparatus.

5, To effect the amendment of the present laws with the object of making them more efficient.

Evidence was given by the authorities in charge of the Kew Gardens and other parks as to the difficulty of maintaining vegetation in smoke affected districts. Only a few hardy plants and shrubs will survive the winter season in the large cities. The main effects of smoke on vegetation are due to the following:

1, Reduction of light and heat from the sun.

2, Soot deposits excluding still more light.

3, Tarry deposits blocking the pores of the plants.

4, Acid deposits lowering the vitality of plants.

The effect upon health of a smoke polluted atmosphere was clearly shown by figures given from Glasgow, where a study has been made of the effect of smoke fogs upon the death rate from bronchial diseases such as bronchitis, pneumonia and pleurisy. The deaths from these diseases alone increased at a remarkably rapid rate during prevalent fogs and could be traced to no other source.

The work of the various smoke abatement societies was described in detail and many suggestions were made regarding the possible future study of this problem. The majority of these suggestions were along the line of determining the actual economic loss to the community caused by smoke, it being generally conceded that the engineering side of the question is well in hand and sufficiently well developed to meet practically all conditions provided careful study is made of the factors involved.

Some of the elements in the economic loss to a city are as follows:

1, Added cost of artificial illumination.

2, Added cost of painting exteriors and interiors.

3, Added cost of laundering and other cleansing.

4, Damage to goods in stores and factories.

5, Effect of gloom upon the efficiency of workers.

Recognition was made of the splendid work done on smoke abatement in Cleveland, Ohio, and Chicago, Ill., where the progress made within the past five years has been remarkable. In both of these cities the problem is handled by efficient departments of the municipal governments furnishing a most excellent example of honest, effective and thorough public service. These two cities are without question well in advance of any other American municipalities in the matter of smoke abatement.

The larger part of the matter presented under this head of laws and legislation would not be applicable in the United States for obvious reasons. A strong plea was made, however, for uniform and definite legislation on smoke abatement. The principal paper in this group urged the appointment of a royal commission to inquire generally into the subject of smoke emission for the purpose, if possible, of having a stringent general law passed by Parliament. It was suggested that this royal commission, if appointed, be directed to inquire:

1, What standard, if any, is desirable as to the color or density of the smoke which should be deemed a nuisance?

2, How the color or density of smoke can best be identified?

3, Are the fines at present inflicted upon offenders sufficiently adequate to act as deterrents?

4, Who should be punished, the owner of the works, the engineer in charge, or the stoker, when smoke nuisances result from the careless manipulation of well equipped installations?

5, Should any industries receive special treatment?

6, Should Government inspectors be appointed to act in regard to the emission?

7, Should Government premises be placed under the obligation to prevent smoke nuisances?

8, Ought any hourly or other time limit be fixed during which black or other smoke may be permitted to issue from factory chimneys?

9, Should all cases be heard by stipendiaries? (Paid magistrates.)

10, Can the issue of an unreasonable quantity of smoke be prevented except in cases of accident or breakdown?

11, Can it be shown that the installation of proper appliances generally results in economy as is contended by "smoke abaters"?

12, The incidence, intensity and duration of fogs and their effects on health.

13, The influence of smoke on health.

14, The damage of smoke to buildings, works of art and property generally.

15, Foreign efforts to cope with the smoke nuisance.

16, How far is it possible by smoke abatement to conserve the coal supply?

17, How far is it practicable to deal with the smoke from private dwelling houses?

CLASSIFICATION OF EXHIBITS

The exhibits may be classified into the following groups:

a, Boiler furnaces; special grate bars and furnace construction; mechanical stokers of all types; smoke preventing devices of various kinds; fuel economizers; briquette making machines.

b, Suction gas plants; gas and oil engines.

c, Open coal-fire grates; stoves and ranges of all kinds; draft regulators and other smoke preventing apliances for domestic fires.

d, Gas stoves and grates; gas heating and cooking appliances.

e, Electric heating and cooking appliances.

f, Testing devices, including anemometers, tintometers, soot gauges, automatic gas analyzing devices, etc.

g, Fans and other appliances for the removal of dust of various kinds from industrial plants.

h, Smokeless fuels, both natural and artificial.

While there was little essentially new in the principles underlying the various devices exhibited, there has been a marked improvement made within a few years in their design and mechanical construction. There was also evidence of an appreciation and careful study of the theoretical side of the question which has undoubtedly contributed largely to the relatively better results obtained in recent years. The exhibits were so numerous and varied that only the most important will be mentioned.

PATENT FURNACES

There were many exhibits under this head, only a few of which possessed real merit. The majority of these appliances consisted simply of properly controlled steam jets with special forms of grate bars. There were a few good devices for the automatic regulation and timing of the supplementary air supply, both over the fire and below the grate. The best of these was the Kowitzke furnace which was excellently designed and simple in operation.

Various types of furnace construction, designed to effect a better mixing of the gases, were also shown. The Gregory patent furnace makes use of a supplementary jet of vaporized fuel oil ejected over the fire, which is claimed to add materially to the efficiency. A special boiler known as the Bettington is designed to allow the use of a mixture of air and pulverized fuel or coal dust, introduced by air blast at the bottom of the boiler which is of the vertical type. This boiler is intended for use at mines or wherever fuel of a finely divided character is available.

CONCLUSIONS ON SMOKE ABATEMENT

In judging of the merits of the various types of mechanical firing appliances exhibited, it should be recognized that all of these devices were designed for local conditions and for burning English or Scotch coals. These fuels cost from $2.50 to $3.50 per ton at the plant, contain from 30 to 35 per cent. volatile matter and 11,000 to 13,000 B. t. u. per lb. In these respects they correspond to our Illinois or other western coals. This class of fuel is not available in New England for economic reasons. The freight charges on coal in this section amount to about $3.00 or nearly three-quarters of the average cost of fuel per ton. It is therefore not feasible or economical to burn any but the highest grade of bituminous coal in this part of the country for industrial purposes. This class

of fuel should contain about 14,000 B. t. u. per lb. and not over 20 per cent. volatile matter. On the chain grate, for example, which gives excellent results in England, this coal could not be burned satisfactorily. It would be impossible to maintain a proper ignition temperature with such a low per cent. of volatile matter without an excessive draft which would give large losses to the stack. The chain grate is meeting with success in this country wherever fuel of the lower grades is available.

Of the other devices, perhaps the most important are those automatically controlling the air supply, both over and under the fire. These eliminate the personal factor of the fireman and should be effective on any type of hand-fired furnace. In conclusion, smoke abatement may be best effected in the present state of the art of fuel burning by thorough consideration of the following conditions. Careful attention to one or all of these factors by competent engineers will increase the efficiency of any plant and with efficient combustion comes smokeless operation.

1, Selection of a suitable fuel with provision for maintaining same at fixed standard of heat value.

2, Careful scientific study of the conditions prevailing in the plant, including draft, composition of gases, temperatures, etc.

3, Design or selection of type of furnace or apparatus best adapted to meet these conditions.

4, Proper construction or installation of same.

5, Careful selection of operating force.

6, Suitable instrumental aids or guides for the firemen and responsible engineer.

7, Frequent and thorough inspection to insure maintenance of highest possible efficiency.

Last year's Egyptian crop was larger than the average. The estimated total for 1911 was 643,825,000 pounds. Although this was less than the 1910-11 crop, which aggregated 750,158,839 pounds, it surpassed that of 1909-10 and approached nearly to the production of 1908-9.

THE AGRICULTURAL DEPARTMENT TO SPIN COTTON

Statement by the Bureau of Plant Industry

Our object in introducing the spinning outfit is to make the official cotton grades of greater value. The grades as established take advantage of all the facts in cotton grading that would be accepted by the trade at the time the grades were promulgated, but the grades as promulgated can be made the basis of something that will be very much more valuable to the whole industry. The grades as established simply take cognizance (1) of the amount of dirt and trash in the cotton and (2) what the color of the fiber is. As a matter of fact, there are other very important properties that are not recognized in the official grades, just as important as the amount of trash and the color. It is easy to see why the amount of dirt and trash in the cotton is an important factor in grading cotton: First, dirt and trash have to be removed in the course of manufacture and it costs money to do it, and the more difficult it is to remove, the greater the expense will be, and that prospective expense causes a lower price to be offered for dirty and trashy cotton. Second, when the dirt and trash are removed they have carried away with them considerable fiber, and the spinable cotton which is secured by the cleaning processes in the mill is greater or less, according to the amount of trash that was in the original cotton as it came in the bale.

It is a striking fact that nobody knows just what the average amount of loss ought to be in cleaning up an average sample of middling or any other grade of cotton. Of course, it will be greater for the low grades than for the high grades, but just how much greater nobody knows. It is easy to account for this. In the first place there have been no universally recognized cotton grades in this country, so that there has been very little encouragement to anyone to go ahead and determine what the average amount of loss from any grade should be. In the second place, the different mills of the country work in such different ways that it would be difficult for any private agency

to conduct such a series of investigations. It is believed that the national government is the agency best qualified and the one that should be best equipped to make such investigations. Its interests are the interests of the entire industry, not any one section of it. This fact will be everywhere recognized, and as the results of such investigations are found to be of general benefit in all branches of the cotton industry, it is certain that any governmental agency taking up the problem will be welcomed everywhere. There already exists the very best evidence that this is so, as the work leading up to the present status of the cotton projects has excited helpful interest all along the line.

The reason why it is desirable to know what the waste is for any given grade lies in the fact that it is upon this basis, at least in part, that the difference in market price is fixed between the different grades of cotton. Periodically certain agencies meet and determine what shall be for a certain period of time in the future the ruling differences in price between the different grades.

There are only two things that really should govern in an attempt to fix these differences in price between the grades: 1st, supply and demand; 2nd, the actual intrinsic value of the various grades. It goes without saying that if there is a sharp demand for say middling cotton and the supply is short, the price will be high; and conversely, that if there is a lot of middling cotton on the market and the demand is slow, the price will be low. Into this aspect of the question the present project does not make inquiry. Such inquiry is left to other agencies. We may simply say that if the trade runs normally and there is no undue interference due to speculation, that the law of supply and demand will in the long run take care of itself.

The second matter to be taken into consideration by any agency fixing the price between grades, namely the intrinsic value of the cotton itself, is in a less satisfactory condition. As said before, no one knows what percentage of sound spinable cotton should exist in middling cotton or any other grade; the requisite tests have never been made. Certain mill managers, it is true, have a fair idea of how much waste there should be in their mills, but no one has ever yet seriously endeavored to determine what the average waste should be through a series of years for each grade of cotton. That is precisely what it is now proposed to do. It is proposed to introduce standard spinning machinery and to produce standard grades of yarn from different official grades of cotton through a series of years, with the object of ascertaining what percentage of good spinable cotton should normally exist in each of these grades. When these facts are obtained they will be of use in all branches of the industry and will be of value in fixing the difference in price for different grades of cotton. The idea is to introduce standard machinery for this purpose, not necessarily the most recently invented and therefore perhaps the best. There is no lack of interest in the improvement of mill machinery or any desire not to have newly invented improvements come into use as rapidly as possible. The point of view taken is that when the results are obtained they should be immediately understood by the greatest possible number of people, and this end will be best achieved by using standard machinery that is at the present time most widely used in the United States. This style of machinery will be used in these investigations regardless of where it is made, the primary object being, as before stated, to secure machinery that will be as nearly as possible typical of the present cotton mill practice.

The work of this character heretofore carried on by the Bureau of Plant Industry has been done in cooperation with factories and textile schools. It is proposed to continue this cooperation, as it is recognized that these agencies in many ways are the very best that can be employed. It is found, however, that while the factories are the only possible source of certain classes of information, that they are much less satisfactory for other classes of information. The view of cotton that prevails in the factory is an entirely different one from that which prevails in the trade or on the plantation and it frequently happens that from the owner

and superintendent down there is scarcely a person in the factory that has ever seen cotton growing or who has any clear cut ideas of plantation problems. It is very difficult under such circumstances to secure a full appreciation of the importance of certain problems in the growth of cotton, problems, however, which have a very important bearing, not only on the prosperity of the grower, but also on that of the manufacturer. Success in experiment work depends to a large extent on a sympathetic attitude on the part of those in charge of the work at all stages. They must fully understand and be in full sympathy with the object of the investigation. This suggests the reasons why the ordinary cotton mill is not a satisfactory place for certain spinning investigations, more particularly in their initial stages.

The textile schools are characterized by another kind of serious difficulties. The textile schools are supported by the manufacturers and the point of view is more particularly that of the manufacturer. One of the principal objects of the textile school is to turn out mill employees of one class or another, admittedly often of a very high class. Our schools of this class are among the best in the world, but it can hardly be expected in such a personnel that there is much higher appreciation of problems of production than in an ordinary mill, and such is found to be the case. Again, whatever experiment is undertaken by a textile school has to be made more or less secondary, the primary object of the school being to teach. Add to this that the experiments have to be carried out largely with the aid of student labor, and we have a set of conditions that leaves room for improvement. The principals and professors in the textile schools all frankly admit that their conditions are not ideal for investigation work. Nevertheless, the textile schools and some of the factories have done some really splendid investigation work, and it is proposed to continue cooperative action with both these agencies wherever it can profitably be done.

Investigators of the Bureau of Plant Industry have been struck most forcibly by the fact that very little effort is made in most parts of the cotton belt to separate the good cotton from the poor. Preliminary examinations that have been made with care show beyond doubt that it will be just as profitable to do this with cotton as it is with fruit or any other product. The producer will suffer just as much in the price he gets by putting poor cotton in with good cotton, as the fruit grower, for instance, will lose by marketing poor fruit mixed in with good fruit. The question is a very broad and complicated one, and it is impossible to say at the present time just how much monetary advantage there will be in the more skillful handling of cotton from the time it is ripe to the time it is baled. No doubt exists in the minds of those who have investigated the subject that it will be more than enough to amply repay all the cost. What is most needed is to get at the details by means of carefully conducted experiments.

To illustrate what is meant, take the matter of cotton root-rot in Texas. Every year there are many thousands of acres of cotton in Texas which suffer from what is called root-rot—a serious disease of the cotton plant, the cause of which is not yet sufficiently understood, and for which disease no adequate remedy has been devised. This root-rot cotton occurs in patches of a few square feet up to several acres. As the cotton is at present handled, this root-rot cotton is picked and put in with that of the rest of the field. As a matter of fact this cotton is inferior, much more so than the cotton growers themselves appear to be aware of. This has been shown by picking such cotton separately, ginning it separately, and spinning it separately, in comparison with cotton out of the same field carefully picked for comparison. It has been found through investigations carefully conducted by the Bureau of Plant Industry that the root-rot cotton grades lower, has more waste, and produces a weaker and inferior yarn. All these differences are sufficiently great to justify an attempt to handle and market such cotton separately, and not run it in with cotton that is superior and so reduce the grade of the whole. The experiments on root-rot cotton

have continued over one season, and in the light of the results of the first season's experiment it is proposed to repeat them a second season for the purpose of getting more normal average results. When it is considered that the results have reached a reliable average they will be published. This root-rot inferiority is only a typical case illustrative of many others.

Another line of experiment that has led to many interesting results and which must be carried through to the spinning stage before they can be fully interpreted has to do with the experiments that have been made in ginning cotton. For years it has been alleged that if seed cotton is stored for a certain length of time, and thus "cured," the lint secured by the process of ginning is superior. There has never been any serious reason to doubt this, and yet the practice of storing seed cotton has never come into vogue. It is difficult to say why not, if the storage of the seed cotton would not cost more than the additional value of the lint obtained by means of storage. The natural conclusion is that the practice has shown that lint so secured is not sufficiently superior to justify the expense of storage. Nevertheless, careful inquiry has failed to show that anyone has ever demonstrated this by actual experiment. In fact it is difficult to see how it could have been satisfactorily demonstrated in the absence of a reliable method of ascertaining the length of the staple and a reliable, accurate knowledge of the effect of various ginning factors, variation of the speed of the saws, etc.

A method of accurately measuring the staple has now been devised and its application to the process of ginning has been shown to be such as to demand a careful investigation of this cotton seed storage question. It is now possible to determine with a degree of precision never heretofore attained, the differences in the length of lint produced by different methods of handling and ginning seed cotton. Here again the results so far obtained are the results of a single season, and for that reason, if for no other, they are necessarily of a preliminary character. The results are very interesting and of sufficient promise to demand the continuance of the work. For instance, it has been shown that stored Lone Star seed cotton may be put through a standard saw gin at any speed between 250 and 600 r. p. m. without any perceptible commercial difference in the lint, or gin yield. Cotton has been ginned in this way and not only measured and carefully compared in the laboratory with the above mentioned results, but has been submitted to numerous very competent judges in the trade and they have unanimously agreed, without knowing the source of the samples, that they were all of the same commercial value. Though this result was quite contrary to what was expected, it is not considered likely that the case would be the same for cotton ginned fresh from the field. It is proposed during the coming season to continue these experiments and to extend them so as to take in a greater variety of conditions. The cotton will not only be ginned, but will also be spun, as it is very difficult and often impossible to give a final judgment on the quality of any sample of cotton until it has been converted into yarn.

Another matter which needs careful consideration in determining the value of different grades of cotton is the difference in price that should probably go with certain differences in color. When ripe cotton is left in the field, subject to the weather, it gradually changes in color. Unless the weather is very unusual there is not much change in other ways. The cotton may become discolored with dirt and it may acquire certain colors due to the action of sunlight or the combined action of sunlight and alternate wetting and drying. It should be borne clearly in mind that the length of the fiber is not materially changed by any of these weather conditions, nor is the strength of the fiber materially changed. Of course we are speaking only of ordinary weather conditions. If wet weather continues long enough the fiber may mildew and deteriorate. We are not speaking at the present time of conditions of that kind. This weathered cotton goes into the lower grades. We will say, for instance, that it goes into good ordinary on

account of the dirtiness of the fiber and the amount of trash that has become incorporated. There is not as much good cotton fiber in that good ordinary cotton as there would be in good middling cotton from the same field, and by that amount, of course, it should be depreciated in value; but how about the color? How much should be taken off the price for the deteriorated color of that good ordinary.

Suppose that good ordinary cotton is to be converted into bleached goods. Naturally a cleaner and whiter cotton, such as might be had from the middling grade or one or two grades above middling, could more easily be converted into bleached goods than could this dirty good ordinary. Keep in mind that the fiber in this good ordinary may be just as strong as that in any other grade. The weather has not seriously affected its strength so that the goods made from it would be just as strong as could be made from any grade. There would be only two differences. You could not make as great a quantity, because there is not as much spinable fiber available from the good ordinary to make the goods out of, and second it would have to be bleached. And there is where the difference in color comes in,—the cost of converting it into bleached goods. It not infrequently happens that good ordinary cotton, that is to say discolored cotton, suffers very seriously in price because, as it is alleged, of the cost of converting it into bleached goods. As a matter of fact the cost of bleaching of a great deal of very dirty looking good ordinary cotton is a very small amount. A great deal of good ordinary cotton is easily bleached. Such good ordinary cotton as will easily bleach should not suffer very seriously in price on account of its color. Now the question is, does it, as a matter of fact, suffer more seriously than it ought to? There are many reasons for believing that it does.

Hence investigations are needed in order to show the character of yarn that can be made from lower grades of cotton, and the relative cost of converting them into bleached goods. Such information, coupled with a careful compilation of the relative amounts of bleached and unbleached goods regularly manufactured will insure a better appreciation of the intrinsic value of the different grades of cotton as determined on the basis of their color. In all this we do not overlook the fact that there is a good deal of low grade cotton which is off color and has become so under conditions that make it practically impossible to bleach it. The amount of such cotton, however, in most seasons is by no means so great as the amount of cotton that falls into good ordinary grades through what may be called ordinary dirtiness.

Though many other examples might be cited, it will be seen from what has been said how many and how strong are the reasons for a national government agency taking up this line of investigation.

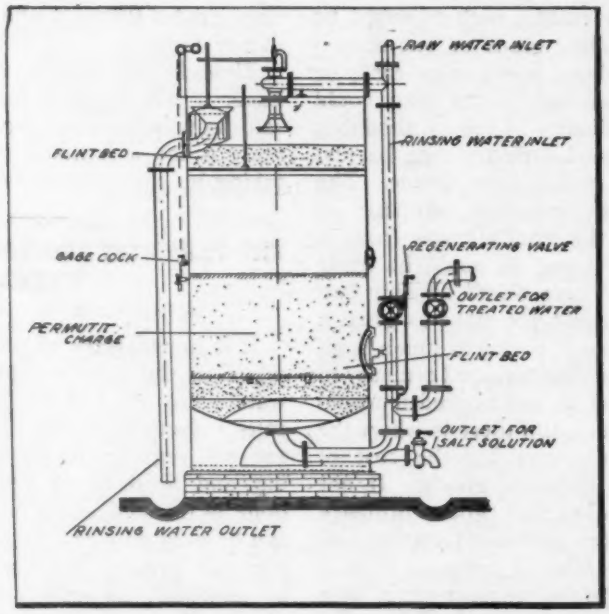
THE PERMUTIT PROCESS FOR SOFTENING WATER

By THOMAS R. DUGGAN, New York

It is unnecessary to point out the advantages to the textile trades resulting from water free from calcium and magnesium salts. Every dyer and bleacher knows only too well regular and perfect dyeing, bleaching and finishing of textiles can only be done in distilled water, which in most cases can be used only as a laboratory check. The permutit process provides water which for all practical purposes is equal to distilled water. The permutit process removes all the hardness produced by calcium and magnesium salts and can by a modification be used to remove all iron, manganese and organic matter which the water may contain. This process was worked out and patented by Professor Gans, of Berlin, who in experimenting with natural zeolites, concluded that artificial zeolites should produce better results than the natural. He set himself to investigate them in a certain way, with this object in view, assuming that a definite composition would produce certain results. After much investigation, he succeeded in producing a crystalline zeolite, which he called permutit, meaning to exchange, referring to its power to exchange

its base for another. A sodium zeolite was produced, its base being sodium, this being the medium of exchange. This power of exchange is somewhat remarkable, as by exchanging the sodium base it is possible to make a permutit of almost any metallic combination, as, for instance, calcium and magnesium permutits, also manganese, tin, potassium, ammonium and other metallic permutits. The one which interests us is the exchange of sodium for calcium and magnesium, by which water is produced of absolute zero, containing neither calcium nor magnesium. The permutit filter used for this process consists of a shell of steel, made in various sizes, for the treatment of various quantities of water, of varying hardness, this shell being fitted with pipes and valves in order to give the necessary mechanical treatment to the water, and also enable washing and regeneration with a salt solution. Inside this shell are placed various layers of gravel and sodium permutit, through which the water to be purified is passed at a good speed. In its passage the whole of the calcium and magnesium salts are absorbed by the permutit, turning the sodium permutit into calcium and magnesium permutit.

It will be obvious that when sodium permutit has absorbed all the calcium and magnesium it is capable of acquiring, something must be done to enable the permutit to continue its work of purification. This is accomplished by the simple addition of common salt to the permutit, which by mass action again drives out the calcium and magnesium, leaving sodium in place as in the original sodium permutit, the calcium and magnesium salts passing down the drain as chlorides in place of the sodium chloride. This process may be carried on continuously without any loss of the original, the only expense being the necessary salt, which is a very low priced commodity. This backward and forward reaction has in practice been proved to be continuous and without loss of the original permutit. Permutit filters are usually made to work twelve hours, and regenerate at night.



SECTION OF APPARATUS FOR "PERMUTIT" PROCESS OF WATER SOFTENING GRAVITY METHOD

A water which may change its hardness frequently as some do, is taken care of automatically, without any chemical control whatever. The chemical and dyeing staff of a factory are thus freed from the usual water troubles incidental to all factories. The usual daily analyses are unnecessary, leaving the chemist free to do other and more profitable work.

Wool washed with zero water is free from lime, while if washed with water of only 3° hardness, it will contain an appreciable amount. The impairment of wool by its lime contents and the difficulty it causes the dyer, are only too well known. Experience shows that for each degree of hardness, 1 1/4 lbs. of soap are destroyed per 1,000 gallons of water treated, so that a water of 4° hardness, and a consumption of 100,000 gallons per day will show a direct loss of $30 per day, estimating the soap to cost 6 cents per pound.

The soap loss is of the utmost importance to manufacturers, and, moreover, is unavoidable, as the softening process completes itself with any soap that may be used before any benefit, such as is expected in the process of manufacture, can accrue.

The obvious conclusion from the foregoing is that a permutit plant in a short time will pay for itself by saving soap without considering its other advantages. When soap plays the part of a water softener, insoluble calcium and magnesium soaps are formed, which are more or less irregularly deposited upon the material in process, whether silk, wool, or cotton. This is a constant source of trouble, causing irregular and uneven shades and difficulties in matching shades.

When silk is treated with soap in the process of manufacture, it is impossible to wash the soap completely from the skein, on account of the formation of insoluble calcium and magnesium compounds. Moreover in the subsequent weighting the tin does not adhere uniformly to the silk, owing to the lime and magnesium soap precipitates that have been formed. The weighting is thus rendered very irregular. The disadvantages which result from the formation of these precipitates in the baths are well known to manufacturers and dyers. The important part which completely softened water plays in this branch of industry is therefore clearly seen.

The great success of the French silk industry is mostly due to the purity of the water used, a fact acknowledged by the manufacturers themselves. Nevertheless, the largest of the French silk houses have installed the permutit process to remove the small degree of hardness of the water.

In many processes it is desirable that water should be absolutely free from both iron and manganese, and when these are present only in very minute quantities, it is almost impossible to remove them entirely by any of the older processes. By treating sodium permutit with a manganese salt, a manganese permutit is produced, and upon passing water through a layer of this, arranged in an apparatus similar to that used to remove hardness, all the iron and manganese salts are eliminated. At the same time, all organic matter, and any bacteria which may be present are entirely oxidized, this manganese permutit being regenerated by the addition of solution of permanganate of potash. The process is very simple, and thoroughly effective, costing very little per 1,000 gallons.

The permutit process is equally well adapted to water for domestic use. Water purified by the permutit process is ideal for boiler plants. The whole of the scaling matter being removed from the water, there can be no scaling in the boiler, and as a consequence, it will be unnecessary to open the boiler except for the annual inspection. All that is necessary is to see that the boilers are regularly blown off and occasionally emptied. Boilers treated with this water will show a marked increase in steaming capacity, reduced consumption of fuel and no cleaning costs.

This artificial zeolite, so-called "permutit," is probably both from a scientific and industrial point of view, the most interesting product which has been worked out for some years past.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

THE DEVELOPMENT OF THE DABBING MOTION

BY JOHN BROWN

The name given to the Noble comb is rather misleading. Although Noble had conceived the idea, its development into a practical machine was the work, not of Noble, but of Donisthorpe. Noble was a hard working mechanic and we find a record of his work as early as 1835. In that year an application for a patent on a comb was made in his name, but the specification was not filed. The year previous he had patented

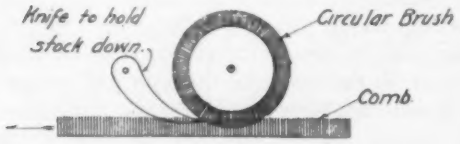


FIG. 1.

a contrivance consisting of combs fitted on wooden arms, but this did not prove successful. In 1853 he conceived the ingenious principle of combing wool by using a large circle, with two small ones working inside of it to clean the ends of the fibers, but he failed to design a workable machine. Finally he took his machine to Donisthorpe, who at once saw the immense value of the principle, and without delay worked out the details necessary for the now well known Noble comb.

Many alterations have since been made in the details of the machine, some parts being dispensed with, others made more effective, but when the rough draft left Donisthorpe's hands on the eventful night of the interview with Noble, it was practically a complete machine and consisted, as it does today, of circles working in a circle, heated by steam chests on which they run, the wool being pressed down by brushes and drawn off by upright rollers. The leathers were made to rise and fall, to prevent wearing all in one place, and the machine was, as it is today, one of the most symmetrical machines used in the woolen and worsted trades.

Ever since the Noble comb came on the market the dabbing brush has been one of its weakest points owing to the amount of care required to set it properly, and the great cost of renewals. Inventors have been constantly trying either to minimize the cost or to abolish the dabbing brush alto-

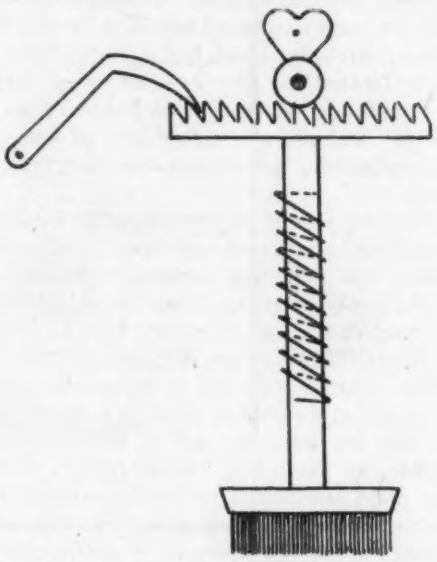


FIG. 2.

gether. I will begin with an account of the various styles of brushes that have been invented. The Brooks invention of April, 1866, consisted of a circular brush resting on a comb, and carried around by the circle, requiring no driving. The stock was held down by a curved knife after leaving the brush, Fig. 1. The result was that the brushes would not stand the strain and the bristles laid flat. In 1872 the brushes were driven from the top shaft, at a speed of 350 to 400 revolutions per minute; this was as fast as they could be run without excessive vibration. This caused a great amount of brush waste. The Garnett invention con-

sisted of a brass frame fixed at the foot of the pillar and just large enough for the brush to pass through. It had a row of short pins pointing downward. As the brush was raised the pins caught the loose fibers, thus preventing any accumulation. All this required very accurate setting and was not generally adopted. The Whitehead invention of 1877 was a combination of dabbing blades and bristles that put the stock in a

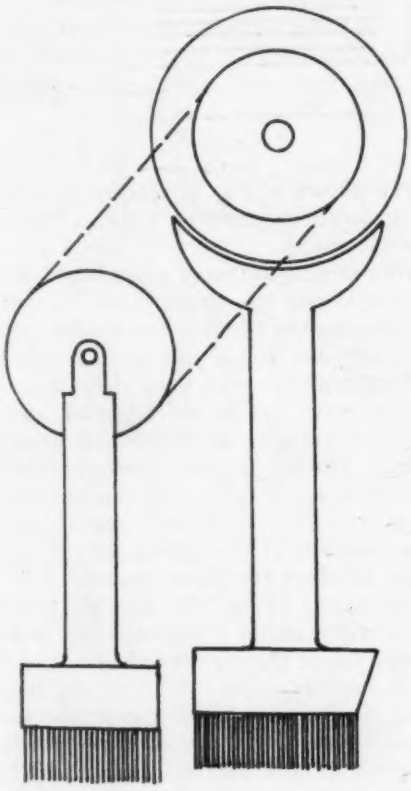


FIG. 3.

circle by a rocking motion. This proved unsatisfactory and was soon discarded.

The circular brush fixed to a revolving spindle and working in a socket was next invented in 1878 by Denby. This is shown at Fig. 2. At the top of the socket a ratchet wheel was moved by a pawl at every stroke of the brush. Instead of a crank drive a heart-shaped cam pressed the slide down while a strong spiral spring raised the brush out of the circle. The idea was to prolong the life of the brush by constantly changing its position. This resulted in too much wear and vibration. Instead of using bristles the Ross and Pearson invention of 1878 states that the dabbing block was filled with diamond pointed steel pins set in rows. Unfortunately the pins of the brush and circle often came in contact. This bent and broke the pins. The circular brushes patented by Terry & Scott with cloth and rubber pads proved no good after two hours' running. The Fairbank and Robertshaw patent in 1883 had small sectional brushes fitted on the side of a revolving disc actuated by cams so as to rise and fall perpendicularly. This also proved unsatisfactory. In the heels of the brushes in the Whitehead patent of 1883 were placed one or more thin plates of steel

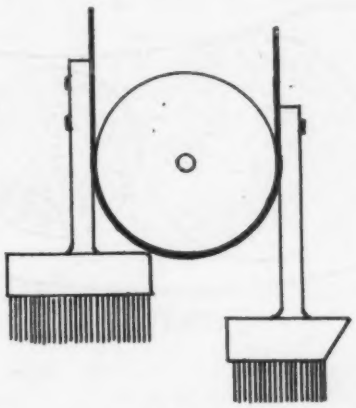


FIG. 4.

among the bristles to reduce wear. This provd fatal when the pins were the least bit out of order. In 1884 Pollard patented a brush made in two parts and worked alternately so that the heel part could be easily replaced. This proved unsatisfactory as the bristles in the heel soon gave away, not being supported by the other part of the brush, see Fig. 3.

Robertshaw and Priestman in 1884 patented a brush made in two parts. In this brush was an oscilating disc driven from the top shaft with stout leather bands passing around the pulley at the base of the pillar, Fig. 4. The result was that the travel of the circle carried the front part of the brush forward and on rising it banged against the

heel part, knocking it out of place, and caused great wear and tear. In 1885 Unwin patented a combined plate and brush for the small circle only. The knives would rise and fall, but were not lifted out of the circle. The brush was very small and proved too complicated in working. In 1886 Sharpe and Metcalfe patented a short brush with a steel plate made exactly to fit between the two circles at the point of separation. There was no saving in this as the heel part soon wore out. The Lister and Brown patent of 1886 consisted of two discs filled with bristles, Fig. 5. The discs turned around as the bristles wore away. There was no saving and it was soon discarded.

Bailey took out a patent in 1887 and in this case two brushes work side by side

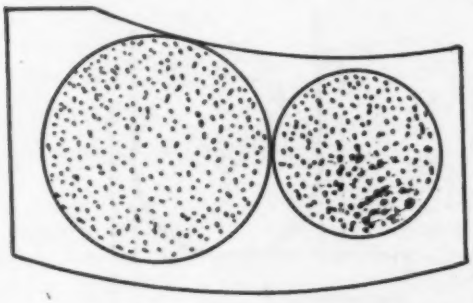


FIG. 5.

lengthways. The brush on the large circle is worked by an ordinary crank. The brush on the small circle is fixed to a lateral spring actuated by a tappet. This is a poor arrangement as the brush does not rise perpendicular. The patentees suggest filling the brush with blocks of wood for wide chambers. Gaunt, Cockroet and Best took out a patent in 1887 for two brushes working in one slide actuated by two cams. This was a slight improvement on Robertshaw and Priestman's idea, but it had the same faults. In 1888 Walker took out a patent which stated that at the tangent point of circles the sliver was pressed down by knives to the pin points with a reciprocating motion, completing the dab by suitable brushes. The brush plates were driven separately.

The Unwin patent of 1889 had three brushes, or rather an ordinary brush divided into three parts, driven from a shaft on which are three cams of different sizes. The heel part had the longest travel. This caused the front part to have a long dwell in the circle and proved ruinous to the bristles, and the working parts were too complicated. Part of the ordinary brush was cut away in the Smith and Stake patent of 1899,

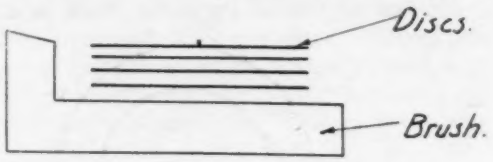


FIG. 6.

which is shown at Fig. 6. Milled discs were used to assist the reduced brush. This was not a success.

Henry in 1905 patented a new style of fixing bristles into the brush stock. In ordinary brushes the bristles are doubled when drawn into the block, but in this case the bristles are all put with the points one way. The root part was bound together with a string, and thus only the point part does the dabbing. There is no risk of the stock being lifted as the brush rises. Another feature of this patent is the use of small wooden plugs with a hole bored through them just large enough to allow the brass drawing wire to pass through. When the bristles become worn to within about a quarter of an inch of the wood block, they are withdrawn, and the plug is inserted in the hole in the block, leaving the bristles standing out the same distance as when the brush was new. A full description if this patent appeared in this magazine in April, 1906. M. Cocker & Co.'s patent in 1912 states that in this invention the brush is of the ordinary shape and size, but the brush block is reinforced both at the front and heel ends with brass strips held in position by copper rivets. A description of this device with diagrams appeared in this magazine in August, 1912.

(To be continued)

The export of laces to United States in 1911 amounted to $439,046, compared with $343,570 in 1910.

A SLUB DETECTOR FOR SPOOLERS

A device for detecting slubs in yarn during the spooling or winding operation has recently been patented in this country. A perspective view is shown at Fig. 1; Fig. 2 is a plan of the detector; Fig. 3 is a section on the line 3—3, Fig. 2. The yarn on the bobbin passes through a guide eye, then through the slub detector, a second guide and an ordinary pig-tail guide to the spool on which latter the thread is wound. The rod which carries the pig-tail guide has a reciprocating motion by any suitable means, so that the yarn taken from the bobbin will

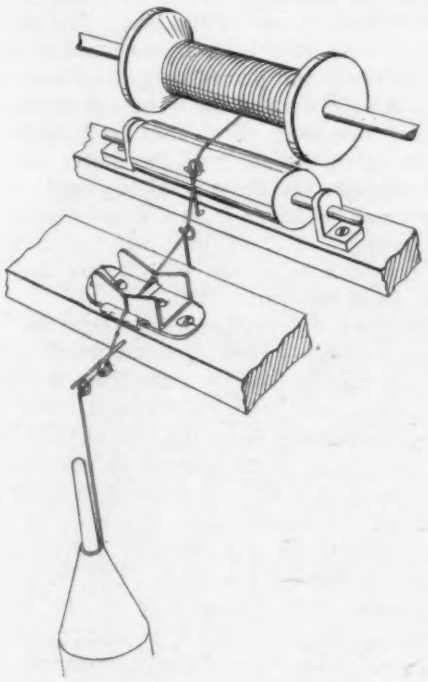


FIG. 1

be laid properly on the spool to form either a cone or a roll.

The slub detector consists of a base plate formed with screw holes to receive screws by means of which the plate is secured to the part. The opposite sides of the plate are formed with extensions which are curved outward to restrict the swinging movement of the pivoted wing. The wings are of U-shape and have their inner vertical edges formed sharp and confronting each other so as to form spaces through which the thread passes as shown in Fig. 1.

One of the wings is secured to the base plate by a set screw, the other wing being mounted on a pivot on the base plate by means of a screw, so that the wing may move from the position shown in full lines

FIG. 2.

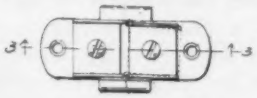


FIG. 3.

in Fig. 2 to the dotted line position. The wing is adjustable to accommodate yarn of different sizes. The abutments restrict the swinging movement of the pivoted wing, and by being rounded do not cut the yarn.

The yarn passes in the space between the wings, and if a slub carried by the yarn or other defects comes along, the pivoted wing will be moved from the full line position shown in Fig. 2 to the dotted line position, thus pinching the yarn. All imperfections on the yarn coming from the bobbin will thus be stopped, preventing them from passing to the spool.

NUB EFFECTS AND HOW TO PRODUCE THEM

BY ELMO

Bocker or nub yarns produce very attractive effects when properly made and used in cassimeres and dress goods. The nubs can easily be made if the process is understood. Short, fine wool of a good felting quality is the best to use for this purpose and by following the instructions here given, good results should follow. Take an old breaker card, set the workers and strippers off from the cylinder according to the size of the nub wanted, and remove the doffer comb. Any first breaker will answer, but one that is out of commission can be made to serve, thus avoiding the necessity of breaking into the regular work of other cards. Run in a sufficient amount of the stock to fill the card. Stop the feed and allow the card to run, and the nubs will drop out in good condition. Fill the card again

as required to produce the quantity wanted.

Felting the nubs will make them more firm and avoid the liability of being reduced in size in the after carding process. This is done in various ways, such as boiling, soaping and pounding, but there is danger of overdoing or a lack of uniformity where these methods are followed. The best results the writer ever had came from the use of a machine similar to a cylinder flock cutter with revolving forks or rods in the place of the cutter, the cylinder turning in one direction and the forks in the other, similar to the action of a revolving duster. I found this machine in use when I went to the mill, but do not know whether it was made specially for the purpose or was a remodeled flock cutter. The nubs were soaped slightly and put into the cylinder, and the felting was produced without the nubs being felted together, as often happens where other methods are employed. The forks kept the nubs well separated, and the felting was sufficiently slow to avoid overdoing the process. In coloring the nubs, care should be taken not to boil too hard or allow them to come in close contact with the steam, as this will tend to felt them too much or unevenly.

The amount of nubs required can be mixed with the lot at the picker, and the workers set off a little in carding to avoid reducing the nubs in size. This method is often employed, but there are sometimes objections to it, especially where fine yarns are made. By setting off the workers the quality of the carding is somewhat impaired. If they are not set off the nubs are reduced in size, and the fibers carded from them go into the body of the yarn, tending to change the mixture or shade. We have seen rowy goods caused by the fibers of the nubs being carded out, producing irregular effects, due to the variation in the felted condition of the nubs, those that were felted the least being more easily carded out. This trouble can be guarded against by introducing the nubs in the card instead of the picker room. This can be done by a special feeding arrangement attached to the card, preferably the second breaker. The quality of the carding is not sacrificed, as the necessity of setting off the workers is avoided. The device consists of a V-shaped feed box about 16 inches deep and the same width at the top, with the length corresponding with the width of the card. There is a feed roll similar to the ordinary feed roll of the card, fitted to enter for about one-half its diameter into an aperture at the bottom of the box. Against this feed roll, outside the box, is arranged a brush made with straight wire fancy clothing, the diameter to be about 5 inches. Inside the box there is a shaft with iron pins passing through it at different angles, extending about four inches from the shaft in each direction.

Suitable bearings for all these can be attached to each end of the box. The device can be supported by a frame work resting on the floor, and placed so as to deliver the nubs directly back of the front worker of the second breaker. The feed roll may be driven from the shaft of the doffer on the end opposite the delivery of the card. The brush may be driven from the fancy shaft on the delivery side and the inside shaft with the pins can be driven with either belt or gear, from the brush shaft.

The feed roll is speeded to suit the required amount of nubs, and the brush is set high enough to free the nubs from the feed roll and deliver them to the card. The inside arrangement is to stir the nubs in the box and keep them constantly in contact with the feed roll. An adjustable strip of metal should be set along the edge of the feed aperture on the delivery side, which should be toward the card. The feed roll and inside shaft should turn in the same direction, and the brush in the opposite direction. The framework is fastened securely to the floor and the top braced from above or from the card frame. It will readily be seen that this arrangement makes it possible to keep the workers of the first and second breakers set to suit the best results in carding and serves to retain the full size of the nubs. The finisher card will comb out the fibers of the nub sufficiently to make them spin well into the thread.

A very small nub giving an attractive, though subdued, effect can be made as follows: Where the creel instead of self feed is

used for the second breaker, fill the workers with tallow as far in from the end as corresponds with the space taken by three or four drawings at the feed, and use drawings in that space of a color of the nub desired. Where the tallow has been used the carding effect will be destroyed, and the stock will roll into small nubs which will be delivered to the finisher in the drawing. The effect may be regulated by the number of drawings used and the width of the tallow insertion. The stock used should be similar to that used for other nub effects, and the drawings made separate from the regular carding and kept ready for use as required. On account of the small size of the nubs, strongly contrasting colors are desirable.

These nubs produce very good effects in dress goods and other fabrics not requiring much gigging.

AN ENGLISH MILL CHIMNEY

In the busy manufacturing town of Darwen there is to be seen what is undoubtedly one of the most magnificent mill chimneys in this country; indeed, a "Darrun" man will tell you that the India Mill chimney is the finest in the world. The structure took about four years to complete, and was finished in 1867, having cost the enormous sum of £12,000. The design is a replica of the famous Campanile at Venice, with the exception that the Venetian Campanile is built chiefly of marble, while the Darwen Campanile is built of bricks, stone and iron.

The total height of the chimney shaft from the bottom of foundation to the top of the iron cresting is 310 feet. The foundation is one solid piece of ashlar stone, said to be the largest block of stone that has been quarried since Cleopatra's Needle was cut out of the earth. A special road had to be cut from the quarry to accommodate the block, and 35 horses were required to draw it to its resting place at the foot of the chimney.

On this base is built a stone pedestal 42 ft. in height, which bears a massive stone cornice 35 ft. long on each side. The shaft rises from this pedestal, and is built with red, white and black bricks, with sand gritstone dressings; it is 24 ft. square, and is built perfectly plumb.

The walls are 3 ft. thick at the top of the stone pedestal, and are reduced by "set-offs" on the inside to 23 in. at the commencement of the main cornice, which is 255 ft. above ground level. Many of the stones used in this cornice weighed over 5 tons each, and were hoisted by steam power. The balusters

A COTTON MILL CHIMNEY

surmounting this feature are of malleable iron, as also are portions of the vases at the corner.

The crown mould of the cornice at the top of the shaft projects more than three times as far over the shaft as it rests on it, and was kept in place by iron cramps until the iron cresting was fixed upon it. The cresting alone contains about 20 tons of metal, and is composed of more than 300 castings; there is no bolting in any part of this work, the parts being kept together by slots and

lugs. The whole weight of this cresting stands upon the brickwork, keeping the upper stone cornice firmly in position.

There is an internal and totally independent shaft 180 feet high to prevent the great heat from the boiler furnaces subjecting the wall of the outer shaft to unequal expansion and contraction. The whole of the work was done by workmen on day work, no contractor being employed, and every brick used was made by hand in Darwen. During the construction of this marvelous pile, although there were one or two narrow escapes, there were no fatalities.

A curious fact about the building of this chimney was that the ownership of the land on which it stands was in dispute, the claimants being Eccles Shorrock and a Mr. Hilton. It was agreed that the one who should put up the most expensive structure on the land and realize on it should have the land. Plans were got out by Mr. Shorrock for an elaborate mill chimney, and the consequence was that Mr. Hilton withdrew, and Mr. Shorrock became the proprietor.

The mill, which is the largest spinning mill in the town, is built entirely of dressed stone, and in the same substantial manner as the chimney. When the buildings were completed in 1868 an art exhibition was held therein from May until August of that year, and was opened by the late Duke of Devonshire, who was then the Marquis of Hartington.—The Cotton Factory Times.

A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

This Series began in July, 1911

WEAVES THAT DEFLECT CERTAIN THREADS

A peculiar effect is given to goods by the weaves shown at Figs. 774 to 794. It arises from the fact that the effect threads in the cloth do not retain the position indicated on the draft. Owing to the method of interlacing the effect picks, these threads are drawn in a slanting direction in the cloth. A different color is usually selected for these deflected threads; mohair and loosely

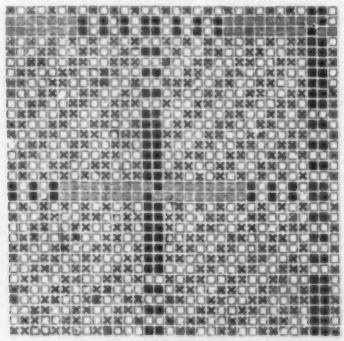


FIG 789

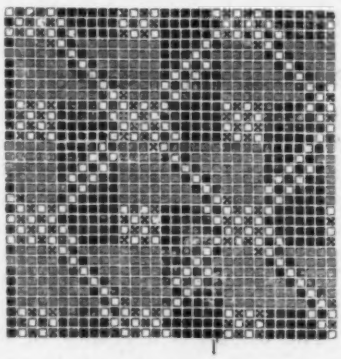


FIG 790

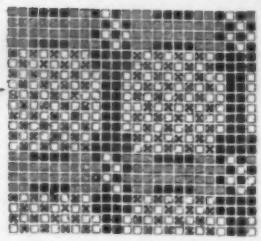


FIG. 793.

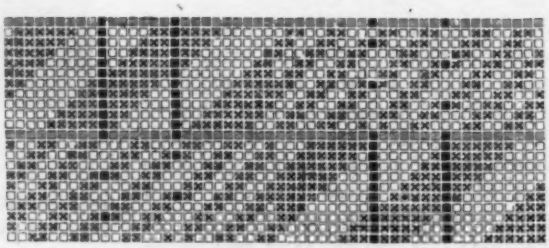


FIG. 794.

(Copyright, 1912, by Samuel S. Dale.)

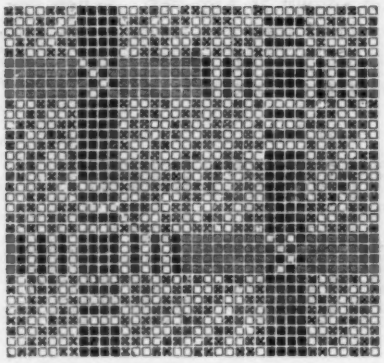


FIG. 791.

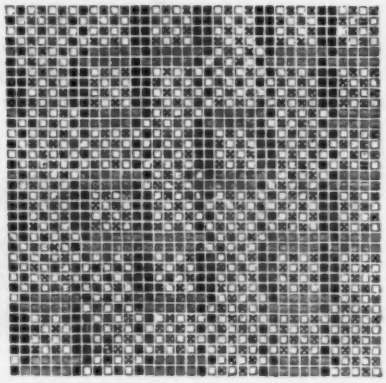


FIG. 792.

FIG. 795

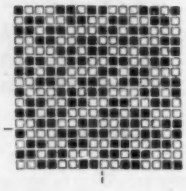


FIG. 796.

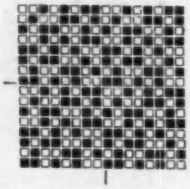


FIG. 797.

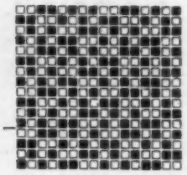
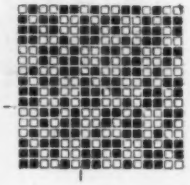


FIG. 798.



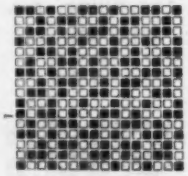


FIG. 799.

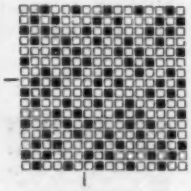


FIG. 800.

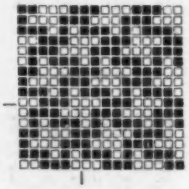


FIG. 801.

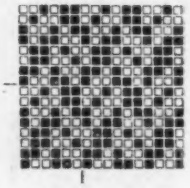


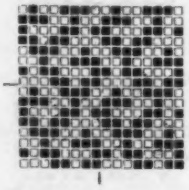
FIG. 802.

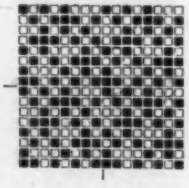
FIG. 803.

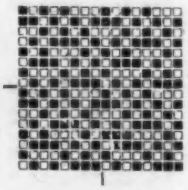
FIG. 804.

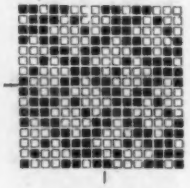
FIG. 805.

FIG. 806.









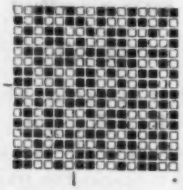


FIG. 807

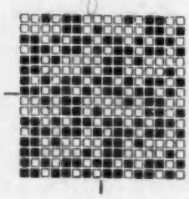


FIG. 808.

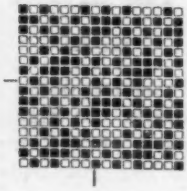


FIG. 809

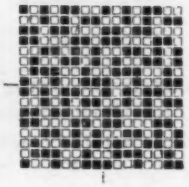


FIG. 810

twisted two-color twist heighten the effect. In Figs. 774 to 794 the effect threads in warp and filling are indicated by the black squares. The limits of the weave patterns are shown by the short lines at the side and bottom of the drafts. The warp color pattern begins with the first thread at the left. The filling color pattern begins with the first thread at the bottom of the draft.

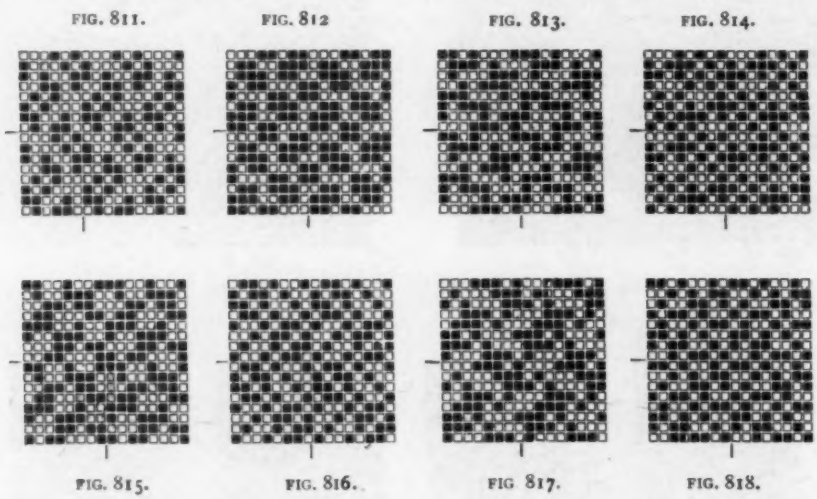


FIG. 811. FIG. 812 FIG. 813. FIG. 814.

FIG. 815. FIG. 816. FIG 817. FIG. 818.

and filling threads separate, taking the position shown at Fig. 785. When the cloth is stretched out, the threads are forced back into the position shown in the weave drafts, forming a rib effect.

The filling floating on the face is indicated by the shaded squares. To increase the undulating effect of the filling, a weave that will facilitate the approach of the effect

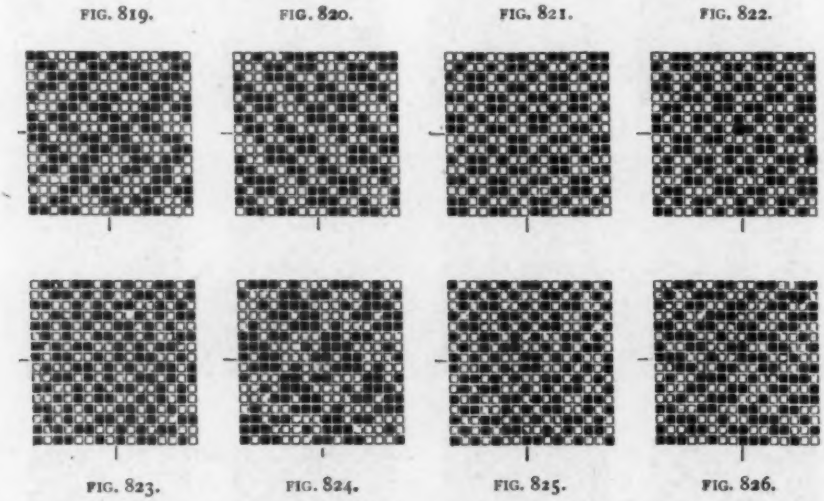


FIG. 819. FIG. 820. FIG. 821. FIG. 822.

FIG. 823. FIG. 824. FIG. 825. FIG. 826.

Unfortunately the changed position of the threads is now shown in the drafts. In Figs. 774, 775 and 794 they assume a curved or undulating form. Figs. 786, 789, 791 and 793 are of special interest because the warp threads to each other is used. This is well illustrated by the twill in Fig. 794.

If Fig. 787 is woven with the warp and filling pattern, 4 red 2 black, the part (a) will show a black and red checked effect, while

in the part (b) the red will be completely covered.

In the following color patterns the words "light" and "dark" are used to indicate the contrasting kinds of yarn in the pattern, such as light shade and dark shade, fine and coarse, worsted and mohair, etc. Usually the effect thread is ply yarn and coarser than the ground yarn.

Fig.	Weave.	Warp and Filling.
774.	6 x 8.	1 dark, 2 light; 1 dark, 3 light.
775.	14 x 4.	6 light, 1 dark; 6 light, 1 dark.
776.	12 x 12.	4 light, 2 dark; 4 light, 2 dark.
777.	16 x 16.	2 dark, 2 light; 2 dark, 2 light.
778.	16 x 16.	4 light, 4 dark; 2 dark, 2 light, 2 dark.
779.	16 x 18.	9 light, 2 dark, 3 light, 2 dark; 11 light, 2 dark, 3 light, 2 dark.
780.	24 x 24.	8 dark, 4 light; 4 light, 8 dark.
781.	24 x 24.	2 light, 8 dark, 2 light; 2 light, 8 dark, 2 light.
782.	10 x 16.	4 light, 2 dark; 6 light, 2 dark.
783.	12 x 20.	2 light, 1 dark; 4 light, 1 dark.
784.	20 x 20.	4 light, 1 dark; 4 light, 1 dark.
786.	24 x 24.	10 light, 2 dark; 10 light, 2 dark.
787.	24 x 24.	4 light, 2 dark; 4 light, 2 dark.
788.	30 x 26.	8 light, 7 dark; 7 dark, 6 light.
789.	32 x 32.	13 light, 2 dark, 14 light, 2 dark, 1 light; same as warp.
790.	20 by 20.	1 dark, 4 light, 5 dark; 3 light, 6 dark, 1 light.
791.	36 x 34.	7 light, 4 dark, 14 light, 4 dark, 7 light; 8 light, 4 dark, 13 light, 4 dark, 5 light.
792.	36 x 36.	2 dark, 4 light; 2 dark, 4 light.
793.	12 x 14.	8 light, 4 dark; 10 light, 4 dark.
794.	52 x 22.	9 light, 1 dark, 6 light, 1 dark, 9 light; 10 light, 1 dark.

CREPE WEAVES

These are weaves in which the warp and filling are interlaced so as to give the cloth a mixed or uniformly mottled appearance. The more uniform this mixed effect is, the better is the crepe effect considered to be. In constructing these fabrics great care must be taken to avoid stripe effects and to have each thread stitched with floats of practically the same length. Crepe weaves are used for all varieties of garments.

No general rules for the construction of these weaves can be laid down, as each weave is peculiar to itself, but examples will be given to show how they can be drafted. A number of the most frequently used crepe weaves are shown at Figs. 795 to 919. The limits of the pattern are indicated by the lines at the left side and the bottom of the respective drafts.

The crepe weaves, Figs. 795 to 919, are drafted as follows:

Fig. 795	8 ends,	4 picks
Fig. 796	8 ends,	8 picks
Fig. 797	8 ends,	4 picks
Fig. 798	6 ends,	6 picks
Fig. 799	6 ends,	6 picks
Fig. 800	6 ends,	6 picks
Fig. 801	6 ends,	6 picks
Fig. 802	6 ends,	8 picks
Fig. 803	8 ends,	8 picks
Fig. 804	8 ends,	8 picks
Fig. 805	8 ends,	8 picks
Fig. 806	8 ends,	8 picks
Fig. 807	6 ends,	8 picks
Fig. 808	8 ends,	8 picks
Fig. 809	8 ends,	8 picks
Fig. 810	8 ends,	8 picks
Fig. 811	6 ends,	8 picks
Fig. 812	8 ends,	8 picks
Fig. 813	8 ends,	8 picks
Fig. 814	8 ends,	8 picks
Fig. 815	8 ends,	8 picks
Fig. 816	8 ends,	8 picks
Fig. 817	8 ends,	8 picks
Fig. 818	8 ends,	8 picks
Fig. 819	8 ends,	8 picks
Fig. 820	8 ends,	8 picks
Fig. 821	8 ends,	8 picks
Fig. 822	8 ends,	8 picks

Fig. 823 ..... 8 ends, 8 picks
Fig. 824 ..... 8 ends, 8 picks
Fig. 825 ..... 8 ends, 8 picks
Fig. 826 ..... 8 ends, 8 picks
Fig. 827 ..... 8 ends, 8 picks
Fig. 828 ..... 8 ends, 8 picks

(To be continued.)

PREVENTING DOUBLE THREADS IN SPINNING

A device for preventing double threads, shown in the illustrations, is a Belgian invention, which has recently been patented in this country. The inventor states that in the various systems heretofore proposed for the prevention of double threads and intertwining in spinning frames, fixed or alternating, or winding machines, the most efficient are those in which metallic plates or rakes are disposed between the threads. These systems are complicated, take up too much space and are in the way of the workers. The object of the present invention is to secure the advantages in point of efficiency that are obtainable by the interposition between the threads of some body through which the threads cannot pass and at the same time to do away with the objections due to the rigidity of the interposed bodies. This result is obtained by replacing the metallic bodies by jets or streams of gas. The efficiency remains as great as before since no thread that tends to catch on to the adjoining thread can traverse such a gas jet, and all doubling or intertwining is thereby avoided. On the other hand, the presence of these gas jets does not in any way obstruct the workers in their operations. In ordinary spinning it will be generally advantageous to utilize hot and moist air for the gas jets.

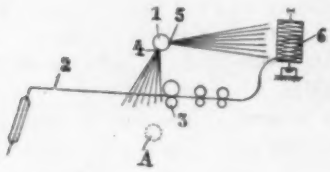


FIG. 1.

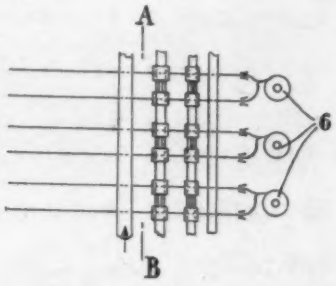


FIG. 2.

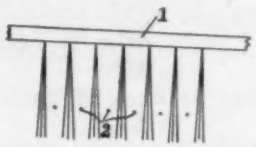


FIG. 3.

Fig. 1 is a side elevation of a frame with the improved device. Fig. 2 is a plan of the installation. To keep the drawing in this figure clear, the course or passage of the gas is not shown. Fig. 3 is a cross section taken on the line, A. B., Fig. 2. A tube, 1, is pierced with a series of holes or slits, 4, suitably placed for the distribution of the air or other gas or vapor under pressure contained in the tube. In this way there is established between each pair of threads a jet or stream of gas preferably spread out in the form of a sheet, which prevents the threads from catching on to each other or twisting around one another. The arrangement may be completed by a second series of holes or slits, 5, which send a current of hot and moist air onto the bobbins, 6, of the rack, so as to communicate to them the excess of heat and moisture required for the spinning. The same result will be obtained by feeding the tube, 1, with air mixed with water vapor. The tube may be placed in any convenient position, according to the style of machine in use, for example, under the threads, as at A in Fig. 1. This current of gas may be continuous or non-continuous. Intertwisting occurs principally in the immediate neighborhood of the drums, 3, and it is to that point that the currents of gas should be specially directed. The direction of the gas jet can be adjusted by turning the tube, 1, on its axis. The width of the jets or streams of gas can be regulated by modifying the section of the holes or slits in the tube, 1, or by moving that tube farther away from or nearer to the threads.

ENGLISH NOTES

By Our Regular Correspondent

The objections brought against the lithographic process of calico printing by members of the National Association of Cotton Manufacturers agree closely with some heard in the English trade. The process is carried on in premises near London upon a plant of four or five machines and the declared object of the operators has rather been to introduce the lithographed goods in as many quarters as possible, than to settle down to steady work for any particular market. The class of printing more nearly resembles Manchester than London work and a project for putting down twenty machines in Lancashire has been heard of, but apparently has not yet taken concrete shape. London goes in for block prints and multicolored machine prints in large designs and of great liveliness, but so far as is known the lithographic method is only suitable for small designs and work in few colors. Lithography is understood to be unequal to printing large expanses of unbroken color and the deadness and opacity of its effects are the opposite of London requirements. Beside the best examples of engraved prints the lithographic samples are palpably inferior in sharpness and delicacy and lithographic pigments of the requisite fastness to light and washing are wretchedly few. The natural mineral colors such as browns are fast, but fastness and brightness are almost absolute incompatibles and when all mechanical difficulties are conquered this old-standing one of the permanence of colors is likely to remain.

* * *

An agreement between the Central Agency, Ltd., and the Drapers' Chamber of Trade marks an important advance in the trust conditions governing the sewing cotton business. At the instance of the drapers the Central Agency (J. & P. Coats's distributing organization) have fixed the minimum retail selling prices of the three principal brands of thread. The drapers undertake not to sell competing brands at less profit and the Agency agrees to cut off supplies from those who cut prices. The effect of the bargain is to give drapers a profit of roughly 25 per cent. upon thread which they have generally sold at prices that did not cover working expenses. The public have been able to buy 400-yard reels of Coats's, Clark's or Chadwick's six-cord at 5 1/2 or even 5 cents in some cases and now they are not to be supplied for less than 6 cents. To dressmakers the draper is empowered to allow 8 1/2 per cent. discount and to Government and public institutions 10 per cent., but to the public no alteration is to be made even during "sales." Following are the net prices at which English drapers are supplied with these three makes also the prices below which the goods are not to be retailed:

Yards	200	250	300	360	400
per 144, net	$4.02	$4.64	$5.80	$6.38	$6.98
Retail per reel	.035	.04	.05	.055	.06
Retail per 144	5.04	5.76	7.20	7.92	8.64

The transaction buys the favor of the drapers who have long sadly contrasted the profits in making thread, and in retailing it. Coats obtain control over the prices at which competing makes can be sold, and manufacturers of other articles will possibly find that the deal has induced drapers to look for protected profits on other goods.

* * *

It appears that Bradford wool scourers are not so callously neglectful of the advantages of steeping raw wool to recover potash salts, as has sometimes been represented. At the Hawich meeting of the Textile Institute the author of a paper on Desuinting declared it well known that one Bradford firm put $125,000 worth of potash into the drains every year. Walter Leach, chemist to the concern indicated, has thought well to issue an explanation. It is true that in France wool is washed free of potash before scouring, but that wool is all greasy Buenos Aires or Australian. In Bradford tops are made from blends into which sliped, scoured and skin wools largely enter and accordingly there is less free potash to recover. Mr. Leach calculates that 100,000 lbs. of greasy B. A. or Australian

yields 5,000 lbs. carbonate of potash, but unless the liquor goes to the evaporator at a minimum strength of 13° Tw., potash recovery does not pay. At Isaac Holden's where the salts are recovered and used for making soap, the experience is that Russian wools are richest in potash and that colonial wools contain more than domestic. The claims were made in course of a commendation of a new machine for dissolving out the salts. In this machine water or potash liquor, supplied from sprays, runs through the wool while the material is being carried forward by conveying tables. Subsidiary benefits were put forward, but wool scourers are more concerned about the main material than the by-products and one present observed that the only thing of interest to the thinking man was how the wool itself was affected by desuinting.

* * *

It has been made a grievance by a textile teacher that the term "woolen" should be applied to everything spun on woolen machinery and the new definition has been called for. The difficulty is not so much to draw a definition as to obtain for it the recognition and use. There is no evident reason why yarn spun on the mule should not be called woolen in the same way that yarn from the frame is called worsted. It is true that the one is more subject to admixture than the other, but the distinction is not affected by that fact. The name everybody gives a thing is that thing's name, and the word "woolen," used in the stated sense, has been acquired by user and its application to goods not wholly made of wool has been recognized at law. On the other hand nobody is compelled to call his own goods woolens, but may invent for them a name of his own. In all the circumstances, the best course for the Textile Institute might be to reaffirm the old truth that "woolen" is an umbrella word of many inexact significations and to advise the world at large to take little notice of it. There is a risk of doing more harm than good by attempts to clothe old words in new meanings. The definition proposed must be purposeless except for use in courts of law, which already have a hard task to arrive at the truth on debated points of trade custom; and it is poor policy to create advantage for one section of manufacturers at the cost of injustice to another.

* * *

The craze for exact definition has not yet led in this country to a "pure" textile bill, but some attention has been bestowed here on the Murdock effort and on the comments made on it by certain textile and dry goods journals. In particular the stupidity of likening textiles to food and drugs has attracted attention in Yorkshire. No comparison is possible between the need for regulating the quality of a drug which will be depended on to save life and that for declaring the constituents of a new suit. It is unpardonably absurd to profess that it is as difficult to recognize cotton in wool as ptomaines in canned beef, or that the capacity for mischief is equal. The real necessity for disclosing the exact composition of textiles is not greater than in the case of a thousand and one articles of use. There is force in the contention of a writer in the "Yorkshire Observer" who holds that before textiles are singled out for exceptional treatment it is requisite to show that the necessity is greater with them than with other goods. It has not generally been thought politic, he observes, to allow misrepresentation more license in one trade than another. The difficulties met in the attempt to define the composition of goods with sufficient exactitude to satisfy foreign custom houses are cited to show the friction that the working of a Murdock law must engender in practice. Were it the fact that the presence or proposition of cotton or waste in a blend gave a real index to the value or durability of the goods the requirement of a declaration might be more rational. But obviously as much intelligence is required with this information as without it. Seeing that the presence of shoddy can never be proved, although it may be suspected, it is pointed out that the Murdock bill would make misrepresentation rather more rife than ever in the woolen trade.

* * *

The hard words that Lancashire has long

used in its public comments on American cotton baling will not seriously lose force when Commissioner Conant's report is digested. It will be recalled that the Private Investigation Committee of 1906 heartily echoed Judge Ogden's characterization of the American cotton bale as a "dirty, damaged, disreputable, water-soaked, wasteful, slovenly, clumsy, highly inflammable turtle-backed deformity." They could get no explanation why the mischief should go on so long other than that "the business of preparing cotton for the market is in the hands of trusts who are deaf alike to reason and remonstrance." The report may confirm their conviction that the cotton handlers are hard to move, but the Commissioner does formulate a tentative remedy for the artificial patching necessitated or encouraged by the contract rules of the trade. Spinners have shown a marked reluctance to agree that Liverpool rules are responsible for the burden of unnecessary bagging and presumably because they see that more than the rules are at fault. It is not hard to understand that they have fears of losing from a change in the allowable weight of tare unless that change is backed up by reforms in the American system. They have less voice in the making of Exchange rules than they would like and the proposal to reduce the tare from 6 per cent. to 5 per cent.—even though it were more sure to result in good—could only come with difficulty from them. Their objections or counterproposals could not be made more fitly than in response to concrete propositions made at such a convention as Mr. Conant proposes.

* * *

Word has reached the English papers that the American authorities have evidence implicating a Sheffield emigration agency in the traffic in contract labor. There are no textile operatives in Sheffield and the delicate business of selecting persons and advancing funds is scarcely one that could be left advantageously to an agency. It is eminently unlikely that any contraband is going on now, but it can be said that in times past recruits have been signed in the private houses of discreet parties. In some cases a bondsman has had to be found to give security for the refund of passage money and there is some reason for saying that enforcement of the bond has been exacted in the case of persons who accepted the money, but failed to sail. The prosecution of firms for evasion of customs duties and of persons for introducing laborers have had a marked effect in this country. As an instance take a message from one partner to another in respect of a proposition only doubtfully in keeping with the tariff regulations. The business had already been refused and the senior in approving the decision added that Americans themselves might monkey with their tariff if they chose, but he would see America in torment before he had art or part in fishy transactions.

* * *

One hundred years ago precisely, the English textile district from Nottingham to Leeds and Huddersfield to Stockport was torn with disorders which the Lawrence riots recall. The Peninsular war was in progress and fathers with sturdy sons were selling their boys to the recruiting sergeant for the sake of the bounty. The mills were at a standstill, distress was everywhere and agitation was busy. The workpeople rose under "General" or Ned Lud and committed the outrages still remembered as the Luddite riots. William Horsfall, woolen manufacturer of Marsden, was shot and killed and attempts were made on the lives of others. The fury expended itself chiefly on mill property and on the machines which were accused of working all the misfortune. No parallel uprising has been known since, although in 1910 there was heat enough in the air to work disastrous mischief. The authorities gave the strikers a loose rein. The police went everywhere with the processions of striking woolcombers, noted everything that was done and stood prepared to act in case disorder should go beyond certain lengths. They did not interfere when technical assaults and trespasses were committed and on the whole their policy justified itself by its results. The heat subsided, the grievances were appeased and little bodily or

material damage was done, although blood would have flowed very freely had the officers intruded their opposition.

INCREASED EFFICIENCY BY ELIMINATION OF USELESS MOTIONS

BY SHANNON

It goes without saying that the efficiency of a machine depends on keeping it in the best possible shape and running at a speed best suited to the work. These two conditions having been decided upon it is easy to figure the theoretical production. In most textile machines more or less time is consumed in removing finished work, replacing it with new, changing and repairing breaks depending partly upon the skill of the operative. These are uncertain factors in determining the time a given machine should run. The amount of soldering that can be and is done by people paid by the day is appalling. The claim that "they are busy all the time" is the one usually made in reply to any criticism, and unless one is willing to analyze the operation at hand it is impossible to determine with any accuracy just how long it ought to take. Many thoroughly conscientious and hard working operatives unintentionally waste a good deal of time simply because they do not know how to do the process at hand in the shortest possible way. The fact that they "have always done it that way" is the best of reasons why it is the correct way.

Trying to replace things "that have always been done that way" with new methods is always a hard proposition and is viewed with suspicion not only by the help, but by the foremen as well. It is impossible to change the opinions of some hard headed overseers. In one of the mills with which I was connected most of the yarn was passed through a cleaning device and then to the bobbin. After the yarn had been threaded through the tension device it had been customary to lift out a roll with the left hand, pass one turn of the yarn around it and replace it in the frame, which we will consider as one movement. There the free end was transferred to the left hand, second motion. The second roll was lifted out by the right hand and the yarn passed around it, third motion, and the free end of the yarn was transferred to the right hand, fourth motion. Then the third roll was lifted out and a turn taken about it and the roll returned to the frame, fifth motion.

The attention of the foreman was called to the fact that the motions could be reduced to three, performing the same operations and could be done in less than three-fifths the time: No. 1 roll to be lifted out by the left

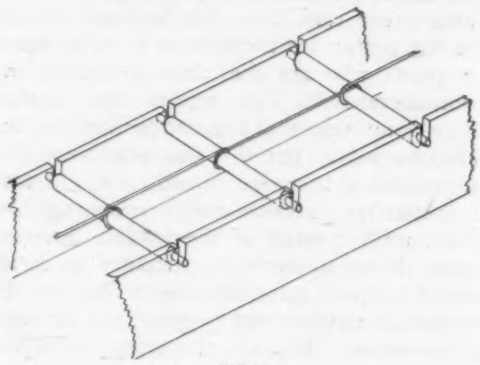


FIG. 1.

hand and a turn taken as in the previous operation, first motion. No. 2 roll to be taken out by the left hand and a turn taken about it and returned, second motion. No. 3 roll to be removed by the left hand and a turn taken as in motion No. 5. This finished the third motion, eliminating the transferring of the free end of the yarn from the right to the left hand, motion No. 2, and transferring it from left to right, motion No. 4.

The writer after a few minutes' trial was able to perform the operation, using the second method, as quickly as the foreman using the method followed by him for 25 years. A few of the employes were taught this method and preferred it to the old, and yet in spite of this the foreman could never see anything in it. This was principally because he was not able to perform the new method as quickly as the old by reason of the fact that his fingers and mind had been trained along these lines for years and did not take to new ways easily.

Fig. 1 gives an idea of the operation. The fact that from 1,000 to 1,500 pounds pass through this room per day and that this

operation has to be repeated every time an end breaks or a bobbin runs out shows how important is the economy. The gaining of the good will of the foreman is essential and was accomplished in the case of a spinning foreman in another mill as follows: On returning to my office one day I noticed this foreman reading a book on motion study and as he seemed interested I left him to himself. This occurred a number of times. When he had gone far enough I inquired what he thought of the idea. He was of the opinion that it was "great" and it also transpired that he had seen the method illustrated by demonstration. I then asked what he thought of motion study as applied to a spinning room. I was informed that he would like to do something along this line, but had no idea how to begin. Finding that he was in a receptive mood we had a heart to heart talk about things in general in connection with the spinning room, finally coming down to a few specific things that I had made up my mind could be improved. One thing that I found particular fault with, was the doffing of the frames which was according to the method employed on most ring frames. When the bobbins were "full," which was left to the discretion of the spinner, the frame was stopped and the boss doffer notified that the frame was ready to be doffed. It often happened that there were a number of frames stopped ahead of it so it had to wait its turn, possibly an hour or more. The outfit of the doffers included a small truck upon which were two boxes, one containing empty bobbins, the other receiving the full bobbins.

The doffers worked in pairs, two to a side, sometimes more, depending upon circumstances. The procedure was as follows: The doffer took a hand full of bobbins and stood up, arranging them with bases all one way. After this a bobbin was pulled from the spindle, the yarn wound around the spindle a few times, and an empty bobbin placed on the spindle. When the empty bobbins were all in place, a girl went along each side of the frame tapping down each bobbin. What broken ends were visible were pieced up and the frame was started and stopped immediately to allow the ends that had snapped off to be pieced up. This operation was repeated several times before all was running well.

The foreman agreed that this was "about the process" and he asked "what do you suggest?" The first suggestion was to have boxes made large enough to hold a few more than enough bobbins to fill one side of a frame, shown at Fig. 2. The boxes were to be made with slanting bottoms so that the

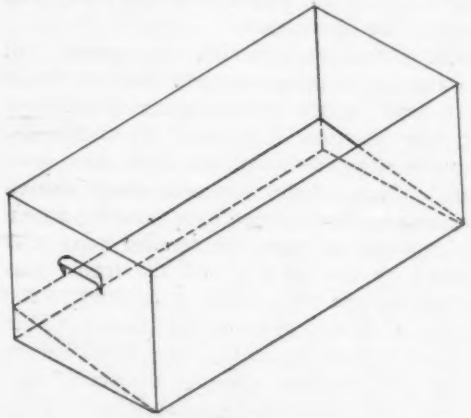


FIG. 2.

bobbins might be placed in them with bases all pointing in one direction. This eliminated the necessity of sorting at the frame. This sorting was to be done by the doffers at the bins. The doffers were then to take the full bobbins from the frame more carefully, instead of yanking them off with the consequent breaking of ends, as was done at present, due to the fact that the bobbins were tapped down, making it necessary to exert a good deal of strength to pull them off.

The raising of a bobbin from the spindle unwinds a certain amount of yarn and in most cases one or two turns will be wound around the spindle. Sometimes the traveler will slide around the ring, in which case a turn will have to be put around the spindle and the empty bobbin placed firmly on it. A few bobbins may have to be tapped to set them home. If care has been taken very few ends will have been broken and the frame will be ready to start. This "sounded nice" at any rate and the foreman said that he would give it a try. A few days later I was making a trip through the spinning room

and saw the foreman standing, watch in hand, timing a frame that was being doffed When the frame was started and hardly an end went down, so few in fact that it was not necessary to stop to piece them up, the foreman turned to me and said, "Seven minutes and I would not have believed it possible." The doffers did not take kindly to this method at first, but as they became proficient, they found that they had more time to sit down, which naturally reconciled them to the innovation.

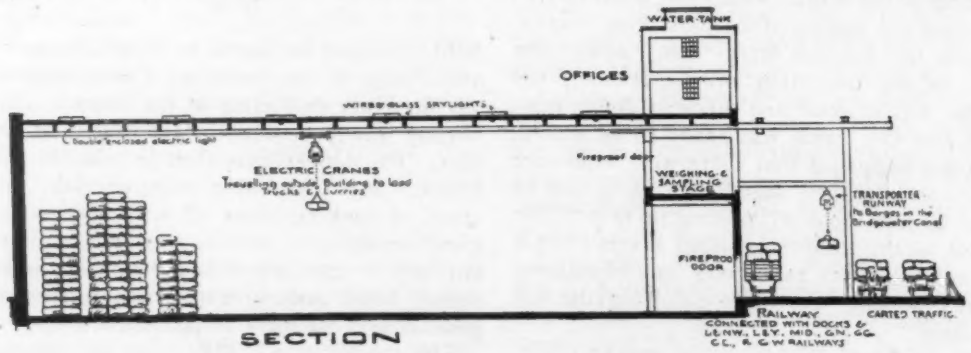
The doffers were divided into squads. All the frames running on one kind of work were kept together and a squad detailed to a certain number of frames. Formerly the spinners stopped the frames when they were "full," which by the way is a much abused expression when applied to a spinning room. Under the new plan the section hand was notified by the spinner and the frame was stopped or run for a while, according to the condition of the rest of the frames. This reduced to a minimum the number of frames stopped for doffing. On one particular size of yarn we were running ten frames, each frame doffing once a day. It often happened that two or three of these frames were stopped at a time, but under the new order the second hand reported that this condition had not occurred in two weeks. The reduction in doffing time from twelve to seven minutes may not seem worthy of notice when applied to one frame, but as it often happens, a number of frames are stopped at a time, especially when a great variety of sizes are being spun. A reduction in lost time means that on such days some frames would run one or two hours longer than would otherwise have been the case.

These experiences illustrate the saving in time and energy that can be made by any man who has charge of help, and who is willing to try to improve his methods. In another mill running on the same class of work and under old methods it is not uncommon to see six or eight spinners called from their frames to piece up when a frame is started after doffing. These spinners have to stop their frames as they are frequently away ten minutes or more. The lost time on these frames, added to the time the frame is stopped for doffing, means a considerable loss, and is due largely to poor doffing.

A NEW STOREHOUSE FOR COTTON

From the Manchester (Eng.) Guardian

The problem of cotton storage is important in Manchester. So far the Ship Canal Company has undertaken to store what was not required by Manchester merchants for immediate delivery, but the quantity that is imported has grown beyond ordinary capacity, and last year the company had to find room for a part of it in various places outside the docks. The new cotton "safes," as they are termed, have been built at Trafford Park to meet this difficulty. They reach from Westinghouse Road to a frontage on the Bridgewater Canal, which gives them an easy connection by barge with the main docks.


WATER TANK
OFFICES
WIRED GLASS SKYLIGHTS
Double enclosed electric light
ELECTRIC CRANES
Travelling outside Building to load Trucks &c. Turning
Fireproof door
WEIGHING & SAMPLING STAGE
TRANSPORTER RUNWAY To Barges on the Bridgewater Canal
FIREPROOF DOOR
RAILWAY CONNECTED WITH DOCKS & L&NW., L&Y., MID., G.N., G.C., & G.W. RAILWAYS
CARTED TRAFFIC
SECTION

THE NEW "SAFES" FOR STORING COTTON.

The building is at present at a stage of incompletion. It will consist essentially, when it is finished, of nine compartments, all on

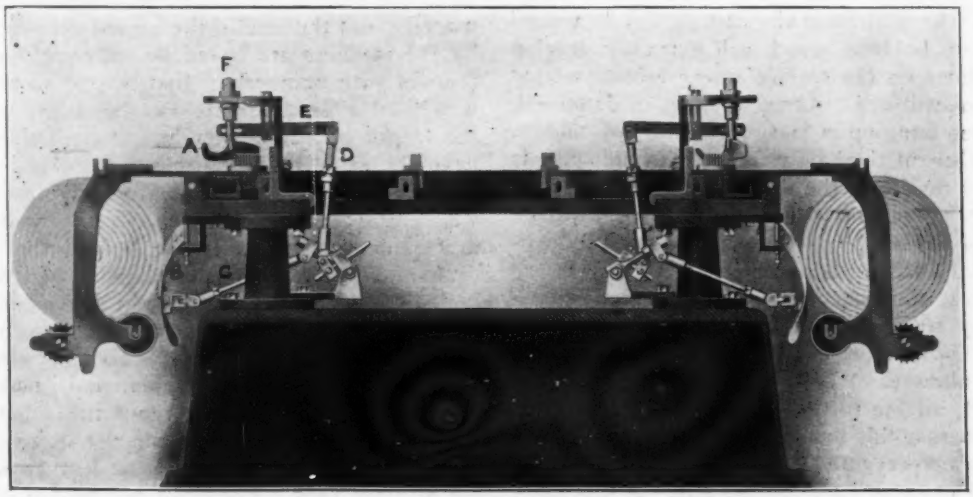
the ground, their longest sides adjoining like a row of pigeon-holes. From back to front they will be 148 ft. long, 35 ft. wide, and about 14 ft. loftier than wide, and the material of their construction is, but for skylights and so on, reinforced concrete. They would hold if they were full 50,000 bales, but the visitors were informed by the managing director, Mr. Marshall Stevens, that there is no present intention of storing so much as that.

The safes are remarkable for the effectiveness with which the plan fulfils the intention—the intention, that is, of providing efficient storage with the greatest economy in working, at the smallest possible fire risk. The economy of time and labor cost is achieved by a wonderful system of electric traveling cranes. These cranes, working at a very high speed, travel in three directions, covering the whole space. They will handle bales inside the building, or over a weighing and sampling stage in front of the building, or over the railway tracks which pass the doors, or over the roadway; or they can be turned into a continuous transporter run-way to serve barges lying in the canal. The other object, of lessening the fire risks, is provided for partly by the plan of the building, which puts the weighing and sampling stage outside, so that merchants' men do not go inside; and, for the rest, by a complete installation of automatic sprinklers and hydrants.

A FEED KNIFE REGULATOR FOR NOBLE COMB

BY JOHN BROWN

This device is intended to supplement or in some cases to supersede the easing motions now in use on Noble combs. In ordinary work the feed knife, A, has to be altered three or four times while each set of balls is running off. As the balls get lighter the stock is delivered more freely, thus causing a heavier noil to be made. The usual method is to have the feed knife fixed in lock nuts, and even then with the best attention the production of noil cannot be kept uniform. With this device the long steel bar, B, is constantly pressing against the ball. As the ball gets smaller the lever, C, travels outward, and by means of the connecting rod, D, draws the lever, E, down, thus gradually raising the feed knife, A, and relieving the pressure on the stock. This results in a uniform feed. The outer end of the lever, E, is slotted and passes through a knife bar, which is firmly fixed in a socket. The bar, D, has a regulating nut, which is used only when changing from stock which requires a heavier or lighter throw-over.



A FEED KNIFE REGULATOR FOR NOBLE COMBS.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

MILDEWED GOODS

Editor Textile World Record:

We are sending a sample cut from some imported shoe cloths. There are several pieces of this and they all show the same spots throughout the entire piece. There are other cloths that came in the same shipment that do not show any of these spots. Can you give us the cause and remedy for these spots? Elmhill (2045).

The greatest enemy of mildew is free exposure to the air. Damp silk will mildew rapidly when surrounded with any covering, or where in contact with other bodies. This may be noticed in the case of tightly wound damp bobbins, which will generally develop mildew on the surface where loosely wound ones will not. Again, a skein of damp silk when hung up in loose form, will not mildew.

One method of meeting this difficulty is by preventing the damp bobbins from coming in contact with each other or with the sides of the box. This can be done by providing peg boards on which the bobbins are stuck, thus keeping them separate. These may stand one on top of the other inside the boxes, provided free circulation of air be allowed.

By adding to the above bath about 1/2 oz. of borax, this tendency to mildew will probably be prevented. It is generally efficacious and does no harm to the silk. If this does not accomplish the result a little soda ash may be used, say 1/2 oz. also, but as this is a very strong agent it will not do to use too much of it.

Another method would be to add to the bath a little of any of the various preservatives that are used for the prevention of decay by the manufacturers of foods, pastes etc.

It may here be noted that mildew does not exercise on silk the same destructive effect that it does on cotton and other tissues, and if it develops it can usually be wiped from the silk without leaving any traces behind.

James Chittick.

MEANING OF GAUGE POINT

Editor Textile World Record:

What is meant by the gauge point of a worsted spinning frame? Is there a gauge point for a worsted drawing frame? Weigh Box (2088).

The term "gauge point" is used to designate a number used in draft calculations when the size of the strand delivered to the machine and the size of the strand delivered by the machine are based on different systems of yarn numbering; that is, one on the weight of a fixed length, and the other on the length of a fixed weight. If both sides have the same basis, no gauge point is required. Take, for example, 2 ends (each weighing 42 1/2 drams per 40 yards = 85 drams) delivered to a roving box having a draft of 8 1/2. No gauge point is required as the size of the roving is found by dividing 85 by 8 1/2, giving 10 drams per 40 yards. Likewise if the sizes are both given by the fixed weight system the calculation is made by a single division and without the aid of a gauge point. Let us assume, for illustration, that it is desired to spin 2.6 hank roving into 30s yarn. The draft will be (30 ÷ 2.6) 11 1/2. If, however, one size is based on a fixed length system, and the other on a fixed weight system, it is necessary to use what is called a gauge point, which is simply a constant number that reduces both counts to the same basis. If, for example, a 7-dram single roving is to be spun into 30s yarn, it will be necessary to reduce one of the sizes to the basis of the other size in order to calculate the draft required. This reduction is made as follows: The fixed weight count of worsted yarn is equal to the number of 560

yard-lengths per pound, or the 40 yard-lengths per 18.3 drams (1/14 pound). It follows that the count is calculated by dividing 18.3 (drams) by the weight (in drams) of 40 yards. In the example given 40 yards weighs 7 drams, making the count (18.3 ÷ 7) No. 2.6. The draft is then found by dividing 30 (yarn count) by 2.6, giving 11 1/2, draft required.

The same result is obtained by reducing the yarn count to the fixed length (40 yards) basis:

18.3 (drams) ÷ 30 (yarn count) = .61 dram per 40 yards. 7 (drams) ÷ .61 (dram) = 11 1/2, draft required.

The term "gauge point" is an unmeaning expression, and consequently confusing. The calculations of draft and sizes can be understood best by bearing in mind that 18.3 stands for 18.3 drams, the 40-yard basis of the worsted yarn count, just as 1 pound is the 560-yard basis for the same count. If 80 yards is used the basis will be 36.6 drams.

PIECE STAMPING COMPOSITION

Editor Textile World Record:

I want a preparation for stamping the back of cloth which will not penetrate to the face. The Cravanette goods are stamped the way I mean.

Colonial (2091).

In the absence of a sample, it is impossible to reply definitely on the specific case named. Probably the stamp is not made with liquid or paste, but by the application of heat to a transfer paper such as the Kaumagraph. No penetration is possible when a design is transferred dry and bodily from a gelatine-faced slip of paper on which the design has been printed in advance. This method enables one to get a clear and sharp impression even from a large surface.

As to the subject of penetration in general, obviously something depends on the fabric as well as on the fluidity of the composition. Aniline dyes used as coloring for paste compositions show a marked tendency to strike through light cotton cloths and it is better to use ground mineral pigments. Where pigment colors are used in an oil or water medium, trouble is less likely to occur from penetration than from "setting-off" onto the next layer of fabric. This in turn is controlled by the fluidity of the mixture and the amount which is supplied. The stamp should be fed as sparingly as possible with color in any case and a fairly tacky mixture should be employed. If cleanliness and good definition are wanted it will be advisable to see what can be done with prepared transfer papers, but there should not be any appreciable penetration if either quick-drying paint or printer's ink is used on a small brass stamp. A pad of leather or rubber should be provided for spreading the color for stamping purposes. There is a yellow bronze preparation ink used by printers as a foundation for printing in bronze metal powder, which serves very well for stamping a large range of fabrics. Regent.

SIZING FELT

Editor Textile World Record:

I would like some information regarding the process of cutting (dissolving) shellac for making felt sizing, that is, a sizing for wool felt. I would also like information regarding the methods of sizing felt with shellac, glue or starch.

Shellac (2089).

Our French correspondent replies to this inquiry as follows:

The shellac used for sizing wool felts is frequently bleached before using. This is done by boiling the shellac in a Javel solution (formed by dissolving hypochlorite of potash with chloride of potassium). The mixture is stirred while being boiled and the process is hastened by adding from time to time some of the Javel solution. After the bleaching process is completed the liquor is neutralized by adding a small quantity of sulphuric acid, the shellac being deposited in the form of a grey paste, which is worked up in various ways to obtain a perfect bleach. For sizing mixtures the bleached shellac is dissolved either in alcohol or preferably ammonia, which is more economical. The shellac is applied to the felt by hand with the aid of a soft brush. Varnished felts are finished in a slightly different manner. The felt is first coated with a solution of white starch and then dried in an oven. After drying the felt is treated with a drying oil prepared as follows:

100 parts linseed oil.
2 parts white lead.

2 parts litharge.
2 parts umber.

After drying in the oven the operation is repeated for the second and then the third time, the varnish being spread by means of a flat brush. The operation is completed by pressing, usually in a hydraulic press.

Gaul.

SPOTS ON KNIT GOODS

Editor Textile World Record:

Referring to the question by "Claxton" regarding spots on knit goods which appeared in the October issue, I enclose a piece of cloth taken from one of our frames this morning. It shows a spot very similar to those "Claxton" asked about in October. The one on the enclosed sample is caused by oily waste on the take-up rolls on the edge of the cloth. I cleaned the waste from the rolls and the spots stopped. Trenton.

COTTON WARP MELTONS

Editor Textile World Record:

For years we have been manufacturing cotton warp meltons, which have acquired a high reputation in the market by reason of the well-covered face. Some time ago the mill in which these goods had been made was destroyed by fire; since then it has been rebuilt and equipped with new machinery throughout. We now find it impossible to make as good meltons in the new mill as in the old. The face of the melton looks teethy and our customers decline to accept the goods. The new cloth is made of the same kind of stock and layout. The only change is in the machinery. The old looms ran 60 and the new looms 90 picks per minute. Can you suggest a cause for our difficulties? Walnut (2085).

To obtain a well-covered face on a melton it is necessary to "burst" the threads in fulling; that is, to felt the goods so that the threads will be matted so firmly together as to form practically one solid mass. This is more easily effected when the threads are twisted soft. Much softer filling can be run on a loom running 60 picks than on one running 90 picks per minute, and we should not be surprised if "Walnut's" spinner had found it necessary to twist the filling harder in order to make it weave well on the fast running looms. This would prevent the "bursting" of the threads in finishing and would cause the teethy appearance complained of.

SIZING ELASTIC WEBBING

Editor Textile World Record:

Can you give me some information on the sizing and calendering of elastic webbing as to ingredients for sizing and proper mixing?

Winsted (2059).

"Winsted" does not state the question very clearly, but I presume what is wanted is a formula for the size used on elastic webbing. The calendering part of the question comes only second to the sizing. The actual process of sizing is practically the same everywhere. There might be a slight variation, which would be unimportant. A small shallow box is used to hold the sizing. A pair of squeeze rolls are on the top with compression levers or screws to regulate the amount of sizing to be left on the webbing after it has passed through the size. The formulas or mixings for the sizes is another problem altogether. There are so many different mixings for sizes that it is difficult to say which are good ones until they have been tried. I will give some formulas which if used on the right material will give good results. I have recommended them to several concerns who can vouch for their being suitable for the elastic webbing trade.

Recipe No. 1

10 lbs. corn starch.
.5 lbs. dextrine.
25 gals. water.

Recipe No. 2

5 lbs. corn starch.
10 lbs. dextrine.
10 lbs. American gum.
1 qt. oil.
25 gals. water.

Recipe. No. 3

10 lbs. sago starch.
10 lbs. dextrine.
5 lbs. American gum.
3 qts. linseed oil.
25 gals. water.

Recipe No. 4

10 lbs. corn starch.
10 lbs. dextrine.
1 qt. glucose.
1 pt. linseed oil.
25 gals. water.

Recipe No. 5

10 lbs. corn starch.
15 lbs. dextrine.
1 lb. glue.
1 qt. isinglass.
25 gals. water.

Recipe No. 6

10 lbs. corn starch.
5 lbs. dextrine.
10 lbs. American glue.
1½ qts. isinglass.
2 qts. glucose.
25 gals. water.

Recipe No. 7

5 lbs. corn starch.
5 lbs. American gum.
10 lbs. wheat starch.
5 lbs. flour (steeped in 1 gal. water).
2 qts. linseed oil.
2 qts. glucose.
30 gals. water.

Care must be taken in the mixing and boiling of the ingredients. The mixings with glue, isinglass and glucose must be prepared first, holding these ingredients until the mixing is warm, then pour in and boiled until cooked. The mixings with flour must also be taken care of. First mix the flour in a pail, allowing 1 pound of flour to a gallon of water and see that all is thoroughly mixed. This mixture can be added cold. The mixings can be changed around to make a hundred different finishes. I well remember a few years ago we had some very good webbing which had to have a thick feel, so a very heavy size was used with considerable glue. When they were dried the goods were too stiff. They then had to be passed through a weak solution of oil to soften them. The sale for these goods was enormous.

The calendering of the webbing has to be regulated according to the finish required. There are different kinds of calenders for different classes of finish. We had a roll machine with the middle roll heated for bright finishes. This was used for silk flowered webbing. In some cases the flower had to be raised after finishing, so we passed the goods over a short bristled brush, back side down, which did the trick nicely. For dull finishes we had a small machine with two wood rolls and one cotton, the cotton roll being a soft one with which we got out some very good finishes. Care must be taken both in sizing and calendering webbing not to use too much tension on the material. If "Winsted" has trouble in the sizings and gets the goods too stiff so that the webbing cracks on each side, pass them through oil and water to soften them. This trouble may also occur if the mixings are too strong. Kenyon.

SCOURING WOOLEN YARN

Editor Textile World Record:

I have read the reply to the question from "Sanford" (2052) regarding the scouring of woolen yarn, which appeared in your September issue. "Sanford" states that the stock from which the yarn is made was oiled with mineral oil. His cost of 30 cents for scouring 100 pounds of yarn is altogether too high. If "Sanford" will have his spinner use a good grade of saponified red oil he will have no trouble in scouring the yarn clean. It will not be necessary to use soap. A solution of water and carbonate of soda will answer every purpose and the alkali will form a soap with the oil that is in the yarn.

Anthony.

WINDING UNDER ON WOOLEN MULES

Editor Textile World Record:

We are having considerable trouble with the yarn winding under the bobbins on our mules. This causes the yarn to break when it is spooled or woven from the shuttle. We think the trouble is caused by the spinner's allowing the faller chain to get too high. Are we right? If not, what is the remedy? Tippecanoe (2084).

Winding-under on woolen mules is very annoying and, unfortunately, very frequent in woolen mills. Attention to the care and management of the machine will generally remedy the trouble, but it is one in which constant attention is essential, otherwise the difficulty will recur. A prominent builder of spinning machinery to whom this question was submitted writes the following:

"There are several things that can cause this trouble. The faller chain may be too high. The mule may be backing off too much, leaving the ends too slack. There may be a flat place on the roll that runs on

the rail. The track may not be level. There may be a low spot in the track as a result of the floor having sprung. Again the trouble may arise from the shoe being too tight. The remedies for the above faults will readily suggest themselves."

—÷—

DENSITY OF BALED WOOL

Editor Textile World Record:

What is the density of Bagdad wool as imported in bales? How does its weight compare with that of water? Douglass (2081).

A cubic foot of water weighs 1,000 ounces or 62 1/2 pounds. A bale of Bagdad wool recently imported measured 51 inches long, 17 inches wide and 17 inches thick; cubic contents, 14,739 cubic inches. The gross weight was 360 pounds, equal to 675 ounces, or 42 pounds per cubic foot. The weight of this bale was 32 1/2 per cent. less than that of water.

—÷—

BLEACHING AND DYEING MOSQUITO NETTING

Editor Textile World Record:

I enclose a piece of mosquito netting and would like to have you advise me as to the best method of bleaching and dyeing this fabric on a comparatively small scale, and also the machinery required. Do you think it would be practicable to bleach and dye in rolls as it comes from the loom?

Gaynor (2077).

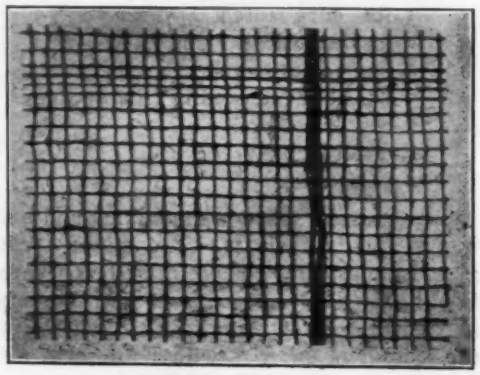
This sample of mosquito cloth is woven with a leno weave. It is first bleached and then dyed and finished. Before bleaching the cloth should be singed. The sample submitted has not been subjected to this process as it is very fuzzy. The cloth is passed through a sulphuric acid solution at 2° Be. It is left in this solution for four or five hours, or even over night, care being taken to avoid the drying out of the cloth. The piece is then rinsed in lukewarm water and boiled in a closed kier under a pressure of 22 pounds, in a solution made up as follows for 100 pounds of goods:

22 lbs. caustic soda.
7 lbs. Solvay salt.
3½ lbs. Marseille salt.
1.1 lbs. bisulphite of soda, 38° Be.

The goods are then removed from the kier, washed and bleached in a 1/2° to 3/4° Be. solution of chloride of lime. After bleaching the pieces are rinsed, then passed through a 1° to 2° Be. sulphuric acid solution, and rinsed again. The netting is finished with the following mixture to which coloring material is added to give the required shade:

7½ lbs. glue, previously softened in water.
2½ lbs. tallow.
1 lb. cocoa paste.
2½ ozs. Brilliant Green, crystals.
20 lbs. logwood extract.
2 lbs. extract quercitron, 5° Be.
30 lbs. flour.

Add water to make 60 gallons (500 pounds)



A SAMPLE OF DYED MOSQUITO NETTING

of the solution and boil 15 minutes. The netting is then finished by running it between squeeze rolls, one of which is immersed in the finishing mixture. After two or three passages through the solution the pieces are dried on steam cylinders and left lying over night, when they are calendered three or four times. Gaul.

Our English correspondent replies as follows:

The manufacture of dyed netting like the sample is an uncommon one in England and machine makers whose opinions have been sought are without direct experience as to the treatment of this form of material. It is apparent that goods much more difficult to penetrate are successfully dealt with in black in vacuum machines and no doubt machines could be made to the dimensions required for the particular purpose. Closed machines are, however, expensive and it would be

worth while to see whether such machines as are used for dyeing cotton warps on the beam could not be used successfully for the netting. In these there are perforated metal rollers or beams on which the netting would be wound at width and in such length as convenient or necessary. The beams are set in a frame and are kept turning while the process continues. The pump in connection with the machines forces water, bleaching liquor or dye liquor at will through the perforations and the surrounding material. No handling is required between the rolling-on and the lifting of the dyed product from the machine. The product can be semi-dried by the pump and passed forward on the beam for the final drying or finishing treatment. The machines are constructed with varying numbers of beams and are especially suitable for dealing with one's own production in a relatively small way. Wessex.

SIZES FOR UNION SUITS

Editor Textile World Record:

What are the standard sizes for men's, women's and children's union suits?

Meanix (2063).

Our knit goods correspondent replies as follows:

Size	Total Length	Total Trunk	Inseam	Bust	Waist	Sleeve
Men's Union Suits						
34	54	29	26	13	..	20
36	56	30	27	14	..	20
38	58	31	27	15	..	20
40	60	33	28	16	..	21
42	61	33½	28	17	..	23
44	63	34½	29	18	..	23
46	65	35½	30	19	..	24
Women's Union Suits.						
34	55	32	26	14	10	20
36	56	33	26	14½	10½	21
38	57	33	27	15	11	21
40	58	33	28	15½	11½	22
42	59	34	28	16	12	23
44	60	34	29	17	14	23
Children's Union Suits.						
2	30	17	16	9	..	11
4	33	18	17	9½	..	12
6	36	20	18	10	..	13
8	39	22	19	10½	..	15
10	43	24	20	11	..	16
12	47	26	22	12	..	17
14	51	28	24	13	..	18
16	55	30	26	14	..	19

Fillmore.

GUSSETS FOR UNION SUITS

Editor Textile World Record:

Will you illustrate a diagram showing the best way to cut gussets for ladies' umbrella union suits, knee cuff union suits and ankle cuff union suits? We wish the most economical way, giving the size machine to knit the gussets on separately, and also the manner in which they are cut in order to produce the least possible waste. The fabric that we are making is a light weight tuck stitch.

Manufacturer (2069).

"Manufacturer" does not state whether a tight or loose stitch is used, but the following would be a good rule to follow: The illustration shows one style of gussets for umbrella style, knee length union suits. If a shaped suit is to be made, the size of knitting frame to cut without waste would have to be determined by laying out one gusset and marking it until a certain size would

GUSSETS FOR UNION SUITS

cut, leaving a small V to go to waste, which does not amount to much. A loose or tuck stitch causes a difference of an inch or more in width. "Manufacturer" does not state what make of machine he is using. Two 12-inch machines of different makes would not make the same width. I find the best way to make a pattern is to secure a sample garment and trace it out. Cymball.

Knitting Department

THE KNIT GOODS SITUATION

The principal topic of interest in the knit underwear end of the business today is the extreme difficulty that is being experienced in getting out deliveries on nearly all lines of desirable merchandise.

Men's fleeced and ribbed cotton goods are sold up well into December, the more recent orders taken at advances of from 12 1/2 to 37 1/2 cents per dozen. Even the better lines of men's flat wool goods are in a well sold-up condition and while no advanced prices have been named on these lines, the percentage of some of the numbers have been changed.

Women's carded yarn ribbed vests and pants have all been advanced considerably. This is a class of goods that is now made by but very few manufacturers and it is difficult to get any of them to accept orders for quick delivery, even at the advanced prices being obtained. The Royal Gem Mills are asking $1.90 for the 6 pound line that was sold early at $1.75, and $2.10 for the 7 pound weight sold in January at $1.85; while the 8 pound weight, sold as a leader at $2.00, is now being quoted at $2.40.

Lines of women's combed goods continue in good demand at advances of 12 1/2 to 20 cents per dozen. This business is now being practically all done on the white plain stitch fabrics, the call for peelers having fallen off considerably during the present season.

The manufacturers of the heavy ribbed fleeced lines sold under the Velvet and Vellastic brands report all the business on their books that they can take care of for the balance of the year.

Lines of worsted ribbed goods are not in quite so favorable a condition as some of the other cotton lines, but a good duplicate demand is looked for and it is believed that worsted manufacturers will be kept fairly busy at the first real advent of cold weather.

The scarcity of underwear is by no means limited to women's and men's goods. Jobbers report quite generally that stocks of children's goods are badly broken up and great difficulty is being experienced in getting supplies from the manufacturer's hands fast enough to take care of the retailer's calls. This is true of the various lines of two piece goods and particularly so of all lines of children's suits on which the business is increasing very rapidly.

Desirable numbers of combed cotton suits to retail at 50 to 75 cents, as well as worsted lines to retail at $1.00 to $1.50 a garment are very scarce.

Boy's suits made of heavy ribbed fleeced fabric have sold particularly well this season, and there has also been a heavy demand for boy's flat fleeced suits to retail at 50 cents.

Manufacturers report an active duplicating business on spring lines and many predict a shortage of light weights by February first. Jobbers have had their travelers out for the past few months and retailers have placed orders quite freely which action has been reflected in duplicate orders to the manufacturers. One noticeable feature in connection with orders so far placed, is that there is a decided tendency on the part of all buyers to place orders for better goods than in former seasons. Where in the past there seemed to be considerable attention paid to lines of straight ribbed vests to retail at 10 to 12 1/2 cents, the business being taken this year is more especially on lines to retail at 25 cents and up. Liberal orders are being placed for plain stitch lisle and combed cotton shaped goods to retail at 50 cents.

In men's goods, balbriggans to retail at 25 and 50 cents continue to be the popular sellers in two piece lines. Colored goods are slow and whites are only fair, but in combination suits white goods have become quite popular and are being sold freely to retail at $1.00; in lisle at $1.50; and in mercerized at $2.00.

A new style suit for women that is meeting with ready sale is a garment made with

wide legs, but instead of being trimmed with lace at the knees, is finished with a shell edge.

We will be able to quote some of the new prices in our next report. It is quite certain, however, that there will be no lower quotations made and quite probable that higher prices will prevail. Conditions are right for higher levels. The demand is good, materials continue high, labor is scarce, and with the restricted hours of labor there is sure to be increased costs of production.

HOSIERY

The situation in the hosiery end is even more acute than in the underwear; not only are manufacturers declining orders every day, but many orders that were given during the early part of the year for delivery in July, August and September have not as yet been reached. The bumper crops in the West are given as one of the reasons for the heavy demand for merchandise and it is said that the farmer is in a better position now than ever before. The heavy demand for hosiery of all kinds is being felt keenly by retailers, jobbers and manufacturers alike.

The finer gauge seamless lines have sold well and it is a difficult matter to find any manufacturer in a position to accept orders for nearby delivery. On fashioned lines the situation is one that might be called "high and dry." The fact of the matter is, the production of all fashioned machinery of this country is covered by contracts for nine months to come. Retailers are placing their orders very freely, principally for black, tan and white.

Considerable interest is manifested when it comes to show light gauze weights, and there are many buyers who are asking for just a little more body in popular priced lines, which shows that the consumers are tiring to some extent of the extreme light weights.

The 25 cent grade of silk hose are not being bought as freely as last year, but the 50 cent qualities, especially those of the fashioned lines, have sold well and some of the best of them will be out of the market early.

Reports from Chemnitz indicate that orders are not being received from the United States to any great extent, although some makers there claim to have sold fair quantities early in the season. Fine gauge goods in dull lisles and mercerized fabrics are about the only lines of ladies' goods being bought by the importers of this country. Considerable new machinery is being set up and some factors look for a reduction on some of the fine gauge goods now being held at M7/50, and quote M6/60 as being the probable price in the near future. A few lace hose are being sent to French and English markets, but none to the United States, and many lace machines are being run on plain goods.

Business on men's half hose is very quiet and many machines are idle. Manufacturers cannot see a profit and will not make up stock.

Infants' socks have sold freely in stripe and jacquard tops, as well as in plain mercerized lines. Many orders have been placed for socks with clocks and embroidery and some of the embroidered numbers have been withdrawn from sale, it being feared by the manufacturers that difficulty will be experienced later in getting help to do the embroidering.

PLATING ON LATCH NEEDLES

BY MAJUBA

Plating, in the knitter's language, means to cover one thread with another, so the inside thread will not be noticed on the face of the fabric. A cheap carded yarn may be covered by a good combed yarn; or a worsted yarn by a silk face. The face thread should run in the regular carrier hole, and the covered thread should go through the hole in the lower left hand corner of the carrier. Any frame will plate in this way, but it will not be satisfactory, as long streaks will sometimes show on the face of the fabric, or give the appearance of an uneven stitch by changing every few inches. In other words, the inside thread would show on the face for a few stitches and roll back to the inside again. This rolling is caused.

or supposed to be caused, by a short, straight dial stitch cam. The cylinder needles drawing down at a point just below the top of the cylinder, casts off the stitch and releases it just as the two threads on

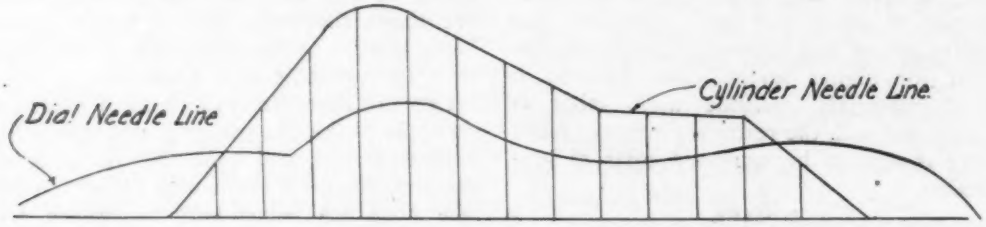


FIG. 1.

the dial needle latches are closing inside the hook. The closing of the latches at this point where the cylinder needles releases, has a tendency to let the two threads roll,

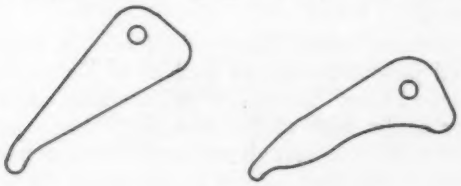


FIG. 2.

causing the uneven looking work. Again, a carrier too close to the needles with both threads almost in line will give the same effect.

The latest machines of some builders are made for plating; only the shape of the cams are changed, which does not interfere with other classes of work. Fig. 1 shows the needle lines on a new frame. The dial needle line is drawn to show how the needles lay in relation to the cylinder needles. It will be noticed that the dial needles start out ahead and have the latch open and idle when the cylinder needles start to push up. This relieves the yarn as only one set of needles opens the latch. If both sets opened together the dial needles would rise and the lower needles push out at the same time. The dial needles on the regular plating cams are idle for perhaps four or five minutes and they do not start to go back until the cylinder stitch is entirely formed and released, as at Fig. 2. The difference in the dial stitch cams can be seen by a glance at Fig. 2. As the cylinder needles return to release position, the dial needles with the two threads on the latches are on the way back to cast off their stitch. The outside thread as it lays on the latches will be the inside thread of the fabric, and the cylinder needles will not nor cannot change the position of the threads, as they have already released and are idle at that point.

In setting the carriers for this class of work care should be taken to have plenty of room for the latches to close, and not have the carrier too close at the heel. Fig. 3

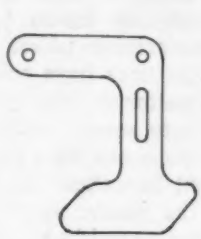


FIG. 3

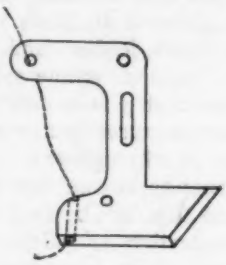


FIG. 4.

shows a regular carrier with no protection to keep the thread from jumping out and running around the top of the dial, filling the cams with waste. Fig. 4 is the same style, but with a plating hole through the heel from top to bottom. Thus the thread does not get out. As the distance from this hole to the needles is greater than in the old style, the plating effect is much better.

The official records of the United States show imports of unmanufactured wool from Greenland, Iceland, as follows: 1906, 342,-415 pounds, valued at $83,230; 1910, 683,166 pounds, valued at $123,681.

THREE NEW NECKTIE MACHINES

The accompanying illustrations show three distinct types of necktie machines recently developed and now being built by the General Machine Works, York, Pa. From left to right are shown the single feed with cylinder and dial, Fig. 1; the two feed with cylinder and dial, Fig. 2, and the single feed cylinder machine, Fig. 3.

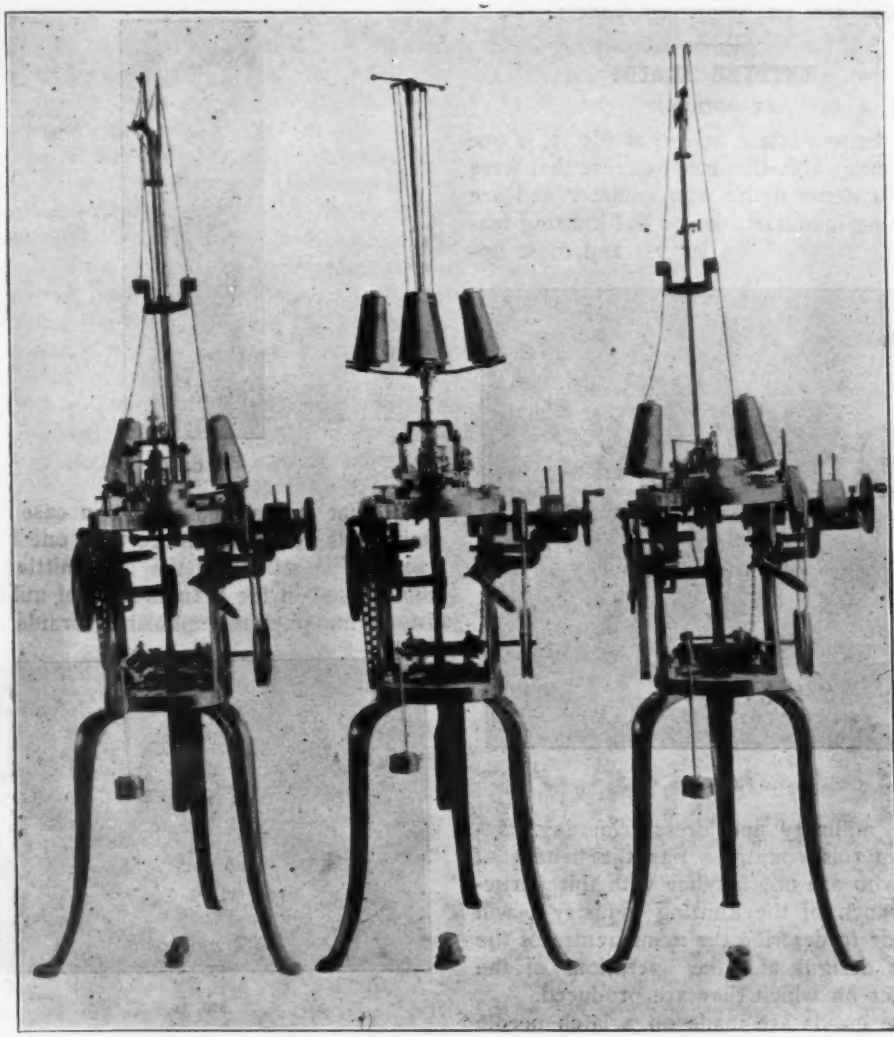


FIG. 1. FIG. 2. FIG. 3.

The builders of these machines claim for them a large production and extreme simplicity in construction. It will be noticed that the machines carry but one pattern wheel and an exceedingly short chain. With each machine are furnished a number of pattern discs and it is the matter of only a few seconds to change to an entirely different design. This patented pattern device, in spite of its extreme simplicity, permits of a wide and varied range of styles, including both those already known to the trade and others of marked originality.

That these machines are destined to enjoy a wide popularity is indicated by the fact that one of the largest silk manufacturing firms in the United States, after a thorough investigation of the entire necktie field, has placed an order with the General Machine Works for these new and improved models.

KNITTED BRAIDS

BY RUTHVEN

The knitted fabric, shown at Fig. 1, is one of the many imitation lace patterns that were in great demand the past summer and are still being manufactured on flat knitting machine by some of the largest and most up-

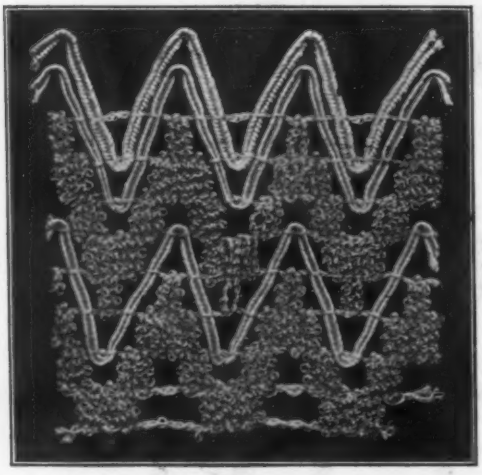


FIG. 1.

to-date millinery and dress trimming concerns in this country. For the benefit of those who are not familiar with this particular branch of the knitting industry I will endeavor to describe the manufacture of the various designs and the operations of the machines on which they are produced.

These goods are made on a latch needle machine. The needles are firmly set in a needle-bar, the needles being fastened by means of small plates set over the ends of the needles. The needle-bar moves the needles vertically through the gauge-bar, which is similar to the gauge-bar of flat knitting machines used in making sweaters. Its function in the flat knitting machines is the same as that of the cylinder in the circular knitting machine.

In the manufacture of knitted neckwear, hosiery, sweaters and underwear, the stitches form practically the whole design. In most cases one thread continuously knit in rounds

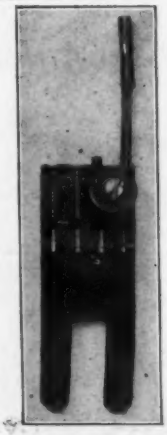


FIG. 2.

is all that is required except in case where striping is desired or more than one feed is used. The stitch on the flat knitting machines used in the manufacture of millinery, dress trimmings and upholstery braids, while

FIG. 3.

it plays a most important part in the production of the pattern, is at times entirely covered by the materials used in the design. The stitches are entirely independent of one another, each warp, as the thread used to make the stitch is called, making its own series of vertical stitches, as shown at Fig. 1. This illustration shows nine vertical warp

threads, which are holding the other materials in their respective position. The nine needles are placed in the needle-bar the required distance apart, and the machine is ready to make the stitch. The needle-bar receives its motion from two heart-shaped cams set on a shaft and connected to the needle-bar by levers. When the needles are at their highest point, that is, when the levers are at the highest point on the cams, a bar known as the warp-bar, set with guides and containing the yarn that is to be used in making the stitch, swings around the needles, throwing the yarn in the hooks of the needle. The needle-bar then descends and sinks a little lower than the edge of the gauge-bar, casting off the stitch. It is then ready for the next course. The casting off commences just before the levers on the needle-bar reach the lowest point on the needle-bar cams, and is completed before the needles begin to rise again. The stitch can be regulated by lengthening the levers and by varying the speed of the take-up.

The next step is to determine the number of links the design requires. The links form the design and answer the same purpose in the flat knitting machine that the cards do in a loom. The bars containing the various materials are shifted by means of pins set in the links to correspond with the position in the pattern. Fastened to these bars are brass plates, Fig. 2, to which are screwed small round tubes, to guide the different materials from one point to another. As the bars are shifted they extend slightly forward from the needle-gauge bar. The materials to be knit in between the stitches pass to and fro between the stitch forming threads and the needle, and are bound by each successive series of stitches. The length of the pin used in shifting the bars vary in all machines. An inch pin will move the bar one inch. The length of the pin determines the distance that the bar containing the materials is to be shifted to its proper position in the pattern.

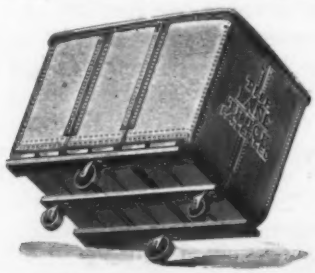
The pattern, Fig. 1, requires fourteen shifts or movements, consequently fourteen links must be placed on each side of the knitting machine and the pins are fastened in them. These links are connected and revolve on a shaft and are controlled by cams which allow them to make one revolution after each stitch is made. They are so arranged that after the links revolve they immediately move inward on the same shaft and cause the pins in the links to strike the bars holding the materials and shift them to the position desired.

There are different materials required for forming this pattern and three bars are used. The first or lower bar contains two ends of 2/10s mercerized yarn and is continually shifted back and forth in the design between the first, second and third stitches to be used as a pull or drawing string; that is, when one of the two ends of 2/10s are pulled, it shirrs or ruffles up the whole design as shown at Fig. 3. The second material in the pattern is what is called a closed chenille or frill, made on a chenille-machine from three ends of 3-ply artificial silk twist. The third material is the one made out of soutache on a braiding machine and is composed of cotton cord filling covered with artificial silk twist. The other soutache at the edge is covered with a number of ends of 150 denier artificial silk. The yarn used in the warps is made of three ends of 2/40s mercerized yarn and three ends of 150 denier artificial silk.

A SPECIAL BASKET FOR HOSIERY MILLS

The illustration shows a new basket or truck recently brought out by W. T. Lane & Bro., Poughkeepsie, N. Y., and which is especially adapted for hosiery and underwear mills. The truck is divided by a partition into two compartments. The partition is made of heavy canvas like the body of the truck. The lower edge is securely sewed to the bottom of the truck and the side edges are laced by a rope through brass eyelets, as a means of connecting them with the sides of the truck. The top edge is stiffened with a steel supporting rod. This partition can be unlaced and laid in the bottom of the basket to permit of nesting trucks for shipment. In other respects the truck is constructed along the general lines followed by Messrs. Lane & Bro. for a number of years and which have proved so successful. Duck of great strength is used. The frames consist of round spring steel so elastic that they stand

severe shock or strain. The only joints in the frame are where the upright or U-shaped members connect at the top with the hoop or rim. The Lane eye-joint is used here, being formed by turning the upright member around the hoop, thus making an extremely strong, but flexible joint. There are no joints in any other part of the frame work



THE LANE MILL BASKET TRUCK

and in this way the simplicity and durability of the truck is greatly increased.

Vertical pockets of heavy canvas are employed, through which the upright frames pass. The continuous feature of these pockets is a decided advantage, in that a perfect relation exists between the canvas body and the stiffening frame. At the top or rim of the truck, tough leather is used as a protection against the chafing at this exposed point. The regular mounting consists of strong iron wheels of ample diameter and tread, the size depending upon the size of the truck. All of the wheels are fitted with a most effectual thread guard, a recently perfected improvement in casters of Messrs. Lane & Bro., which prevents thread and waste from winding about the axle. Heretofore thread guards have been confined almost altogether to wheels of small diameter, but with the improved guard which is employed here, the larger sizes are made practical. The Lane trucks and baskets have another decided advantage in that there is absolutely no roughness on either the inside or outside to cause drawn threads or any other damage and waste. Light weight is also a feature which, along with the easy running wheels used, make the trucks much easier to handle. Messrs. Lane & Bro. report thus far in 1912 by far the largest sale of these and other canvas mill baskets in the history of their business. A number of firms have equipped large and new mills throughout with Lane trucks, baskets and boxes.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

KNITTING MEMOIRS

BY CYMBAL

(Continued from October.)

I certainly had all I could do on that job as a second hand. Between the brass cylinders and the chain motion for the shaped goods, there was no time lost. But I did as well as could be expected and as time passed I became more familiar with the machines. We had very little trouble with the dial or dial cams, the cams being thin and most of them quite hard. I received my first lesson in cam grinding from a knitting machine salesman about that time. We did not have three sizes of emery wheels at that time. We had a wooden wheel half an inch wide and 6 or 7 inches in diameter. On this we tacked the emery cloth. All our smoothing work was done with this device.

We had a frame that had always given more or less trouble by dropping stitches on the cylinder. I asked the salesman to look it over carefully. We even took it apart to look at the cam ring, but could see nothing. I put it together again and had it running before the salesman left. A few hours later I received a note from the office which read: "See if the cylinder latch has room to close up, before going behind the guide." I looked the cams over and found either two or three that would allow a latch to close before going far enough behind the guide to hold it open. The drop stitches were caused by the yarn going over the spoon of the latch too quick, as the latch would snap shut. I had prepared to make a longer guide when I thought of grinding the cam to let the

needles push up slower. I did this and the drop stitches disappeared. I took no credit for this and did not speak of it.

I had been a second hand for over a year when the overseer quit to take another job in Philadelphia. I took his place and being young it was quite hard for me. I had confidence in my ability to fix the frame, but had some doubts about being able to handle the supplies, orders and help. I had a little old man who had been a knitter for years as a second hand. I put on another young fellow as a fixer, and he was a mechanical genius. He knew nothing about knitting, but picked it up very quickly and was a great help in a few weeks. Between us all we managed to keep things going.

About the first thing we did after I took change was to fix up the shaping chains, as they were a continual source of trouble. There was no way of adjusting them to allow for wear. A long pawl with a roller on one end and a ratchet dog on the other, had to be set to push the ratchet drum, Fig. 1, one link. Many times a garment would come anywhere from a foot to three feet long or short. The only remedy was to watch and catch the machine in the act. To overcome this I had a screw put in the pawl where it rested on the cylinder plate. I had a check nut on this screw to hold it tight. This screw could be regulated for either a long or short throw, Fig. 2. This was a big help, but we still had trouble from the chain kinking or the drum springing. Another bad feature of these old machines was the bending of the cylinder latches. The guides were soft and it was very easy to cut them badly if close to the needles. We tried a latch opener to hold the latches down behind the guide and the result was that we tore out all the needles at the first smash.

We never thought of hardening or polishing the inside of a guide, so we did the best we could with what we had. The two fixers were doing as well as could be expected and I had time to look around. I also took time to fight with the boss spinner. We were using a jack spun cotton yarn on some of the frames and some days it was very bad. The boss winder also came in for many a call down, as he was not able to send the yarn fast enough. I had only a small interest in either card room, spinning room or winders, as we bought most of our yarn.

One day an agent for a new rib frame called. He had several of the firm with him when he came out to the "ribbed" room, as our latch needle room was called. He was trying to sell, loan or give away a frame so the people in the town could see it run. The firm did not take to the proposition as they did not put much faith in a latch needle frame, but the agent induced them to let him put one in on trial. When this new

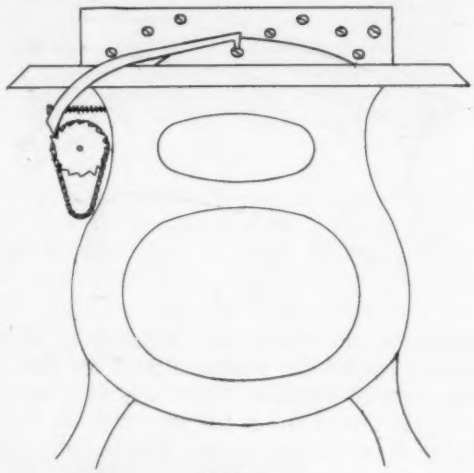


FIG. 1.

frame came we set it up and started it. It had a new style yarn rack, larger take-up rolls, a dial cap that could be raised high enough to permit looking under it, and best of all a gate to the cylinder ring, Fig. 1. The cams were also made thicker and the machine had a wrought iron cylinder and dial. This, a 13 inch frame, was making 50 turns a minute, and about the best any other frame in the room could do was 35 to 40 turns. We kept the frame going about a month with no trouble at all. The agent called nearly every day, and I learned the art of knitting from that agent. He would sit in front of that new frame and talk knitting by the hour. His explanation of a long draw, short draw, pick up and push up cams, and angle of cylinder stitch cams, I never forgot.

He was full of new ideas. He finally got an order for ten frames. We had all the new frames set up and running before the agent left. Selling machines does not include setting them up these days.

There was talk then of making men's goods on latch needles. Our superintendent talked it over with me and I asked him to show me a piece of the cloth. He could not get it, but I made the heaviest piece of cloth I could on the coarse gauge dial and cylinder, but this would not do as it looked like ladies' goods. I had ordered a cylinder cut six needles to the inch and a few days later I

FIG. 2.

made the cloth that was wanted. I then made a roll of the cloth and tried the different styles of finishing. This was in a white and gray mixed and it did not finish up well. We then tried a brown and it came out very well. It was a plain stitch fairly tight with plenty of stretch. This took well with the trade and before the year was out we had moved to a larger room, two stories above, had a small engine put in and was going night and day. I just about lived in that mill. I had the day second hand take charge nights and filled his place days with a man from Philadelphia. We ran all the machines, except a few that had the small roll take-up rollers, on men's heavy goods. These goods were tied in bundles of a dozen each, thrown in a yarn case and sold at a price that would seem ridiculous now.

We finally stopped working nights as there was some trouble in the firm, and in an argument over knitters' wages I quit. I had been with them as foreman about two years and I knew I could handle any latch needle room. It was easy to get work and a short time later I was on the job again. There were only about 20 frames and a few sleevers in my new room. The sleevers were in bad condition as were most of the body frames. We were making a six-pound shaped shirt, all cotton. The stitch on some of the frames was bad. It looked like the result of uneven yarn, and there were also plenty of holes. The former knitter had not had experience and got the job through a family connection. The firm wanted sleeves first as the bodies were piled ceiling high in the cutting room. There was a bad smash with the first sleever I tried. The dial cap set screws had been left loose and the frame started. When going full speed the cap had raised itself on top of the butts of the dial needle. The result was broken and bent needle butts and slots jammed. I lifted out the dial and cap, took them to the bench and fixed up the slots, replacing them in the frame and putting in new needles. I then started the machine going and it ran well, but too fast. It was going about 100 turns a minute and I knew the frame could not

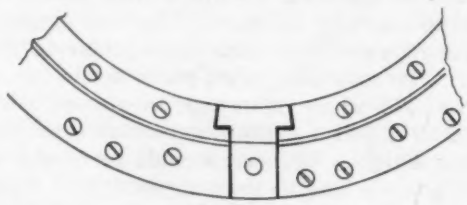


FIG. 3.

stand it. I reduced them all about 20 turns and started on the next sleever. There was nothing the matter with this one; it only needed adjusting. It was loaded up with waste an inch thick. The take-up was loose and the dial too low. I broke the ends out, pulled the cloth and waste from the needles, put good needles in where they were needed, put the cloth on, and, after I had made the necessary adjustments, the frame started off.

Another one of the sleevers, as I remember, frequently had a course of plain stitches, caused by a loose screw in the cam that made the tuck stitch. The strap from the chain would not push the cam far enough, as the screw gave enough to let the cam

stand still. A few turns with a screw driver fixed this one. I was not a very fast workman, but managed to get those six or seven sleevers going in about a week. We were then getting plenty of poor winding on a fair quality of yarn and I decided to take a day off and look the situation over. The winders were new and in good order, so the fault lay with the operators. They had a No. 11 or 12 yarn on small tubes and tried to keep up 18 ends on a fast winder. There was enough yarn ahead for a few days so I tried the experiment of giving each one 12 ends. Some of the strippers were too wide and would not allow bunches or soft ends to go through. These were closed to about the size of the yarn and the speed cut down. The yarn would not run off the last seven or eight courses on the tube and the fast speed made the tension too hard. These were the days before cones and stop motions had been introduced.

AN IMPROVED SEWING MACHINE FOR KNITTING MILLS

The illustrations, Figs. 1 and 2, show the latest finish for underwear brought out by the Metropolitan Sewing Machine Co., Nyack, N. Y. They claim this method of finishing results in a saving of at least 7 cents per dozen as compared with the old style of finish. The work can be done by inexperienced hands and the production by one operator is increased to thirty dozen per day as compared with a production of twenty to twenty-four dozen by the old method. The band can be cut narrower to the amount that was formerly basted in, this resulting in an additional saving. If there is no turn in on the fly of the drawer the sizes can be cut from a roll one inch smaller and yet have the waist measurement the same as with the old style of finish. The drawer bands are not turned in thus enabling the band to be cut shorter.

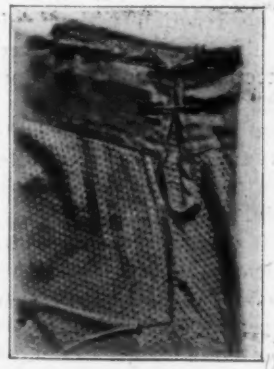


FIG. 1.

FIG. 2.

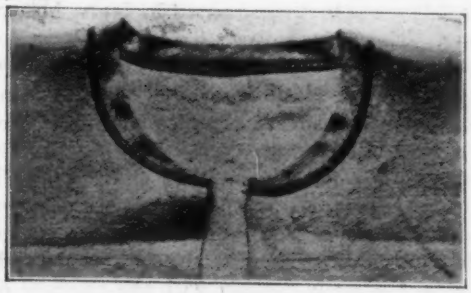


FIG. 3.

The Metropolitan Sewing Machine Co. have recently brought out an automatic taper collarette machine. A sample of the work of this machine is shown at Fig. 3. By the old method the collarette is first cut to the tapered effect and then sewed on by hand, the production of a taper being about forty dozen a day. The new Metropolitan machine has a duplex trimmer and a device to shift the binder in proportion to the amount trimmed off. It is in use in a number of mills and stated to be giving a product of one hundred to one hundred and twenty dozen per day. The machine is also built in the three-needle design and will handle the single ply or Cooper collarette as well as the one shown.

Dyeing, Bleaching, Finishing, Etc.

BLEACHING COTTON

BY J. M. MATTHEWS

Yellowish stains on hot calendered cotton goods are sometimes caused by faulty bleaching. These stains are of a brownish yellow color and are distinctly noticeable when the goods come fresh from the calender, and they usually fade to a yellowish tinge after long standing in the air. Investigation in many cases has shown that cloth in which these stains are developed has been bleached in a chloride of lime liquor, and then folded down in piles exposed to the air. On standing in the air in contact with the chloride of lime solution, there is liability of having portions of the cloth become more or less dried by evaporation. Under such conditions the bleaching liquor in the cloth will become quite concentrated, and in consequence may act on the cellulose of the fiber, converting it into oxycellulose. On application of heat to these places the decomposition of the fiber is rapidly brought about, leading to the brownish discoloration as well as a weakening of the fiber. That oxycellulose exists at these stains may be proved by testing the fabric in the following manner: A sample containing one or several of the stains is cut off and first boiled well in a soap solution in order to remove finishing compound. The sample is washed in hot water and boiled in a 10 per cent. Fehling's solution for 15 minutes on a water-bath. It is finally well rinsed with fresh water. A precipitate of red cuprous oxide is formed on the discolored spots; this is the characteristic test for oxycellulose. Fehling's solution consists of a mixture of copper sulphate, caustic soda and Rochelle salt. The latter is the compound sodium-potassium tartrate. The solution is usually prepared in the following manner: 70 grams of pure crystallized copper sulphate (bluestone) are dissolved in about 200 c. c. of distilled water, and if the solution is not perfectly clear a few drops of sulphuric are added. There is then added a solution containing 350 grams of Rochelle salt and 100 grams of caustic soda in about 500 c. c. of water. The mixture is diluted to one liter by the proper addition of water. For each test about 25 c. c. of this Fehling's solution is used. Owing to the fact that a Fehling's solution prepared in this manner is liable to undergo chemical change and alter in strength, it is frequently made up in the form of two solutions and kept in separate bottles. One solution consists of the copper sulphate dissolved in one liter of water; the second solution consists of the Rochelle salt and caustic soda in the same amount of water. In making the test in this case 25 c. c. of each solution is taken and mixed together just previous to use.

The action of Fehling's solution is based on the fact that certain organic bodies, like glucose and certain sugars have the power of reducing the copper compound present in the solution to the form of an insoluble red cuprous oxide. This is one of the characteristic reactions of oxycellulose, and serves to distinguish it from unaltered cellulose, which gives no reaction with Fehling's solution. Hence this method forms a very good means of detecting the presence of oxycellulose, especially as the red cuprous oxide is precipitated in the fiber where the oxycellulose occurs, and becomes fixed therein, thus indicating accurately not only the presence of oxycellulose in a general way, but also just where it occurs. Dyeing with a solution of Methylene Blue has also been suggested as a means of detecting the presence of the oxycellulose; the reaction in this case being that the dyestuff is rather strongly absorbed by oxycellulose, while it has little affinity for ordinary unaltered cellulose. If a fabric containing spots of oxycellulose is dyed in a dilute solution of Methylene Blue and then rinsed in fresh water, such spots will be located by being of a darker blue color than the rest of the cloth. This test, however, is not very satisfactory, especially in the case

of bleached cotton, or when the formation of the oxycellulose is not very strongly marked. Fehling's solution is much to be preferred.

REMOVAL OF STAINS OF MINERAL OIL

The removal of grease spots and stains of mineral oil in the bleaching of cotton cloth has frequently been a serious problem to many bleachers, and numerous methods have been suggested for the purpose of effecting this result. The mineral oil stains are usually acquired by the cloth in the process of weaving and consist of the machine oil from the loom mixed with more or less iron rust and carbonized material. When the cloth is boiled-out in the kier in the ordinary manner with either lime or caustic soda and then bleached with chloride of lime liquor, there is always a stain left where the piece was contaminated with the oil. After such cloth has passed through the bleaching operation it is extremely difficult, if not impossible, to get rid of the stain as it has become thoroughly fixed in the cotton fiber. The only remedy is to remove the stain in the boiling-out operation before bleaching.

Several years ago, Schweitzer suggested the use of aniline oil or crude phenol as an addition to the lime or soda solution employed for the boiling-out of the cotton, in order to get rid of objectionable mineral oil stains. According to this process the best results are obtained by using small quantities of aniline oil or phenol which may be readily dissolved in a soap solution. The cloth is steeped in a solution containing 6 quarts of aniline oil, 25 gallons of water, and 10 pounds of soap before being run into the kier. It is said that about 3 gallons of aniline oil will be sufficient to treat 4,000 pounds of cloth.

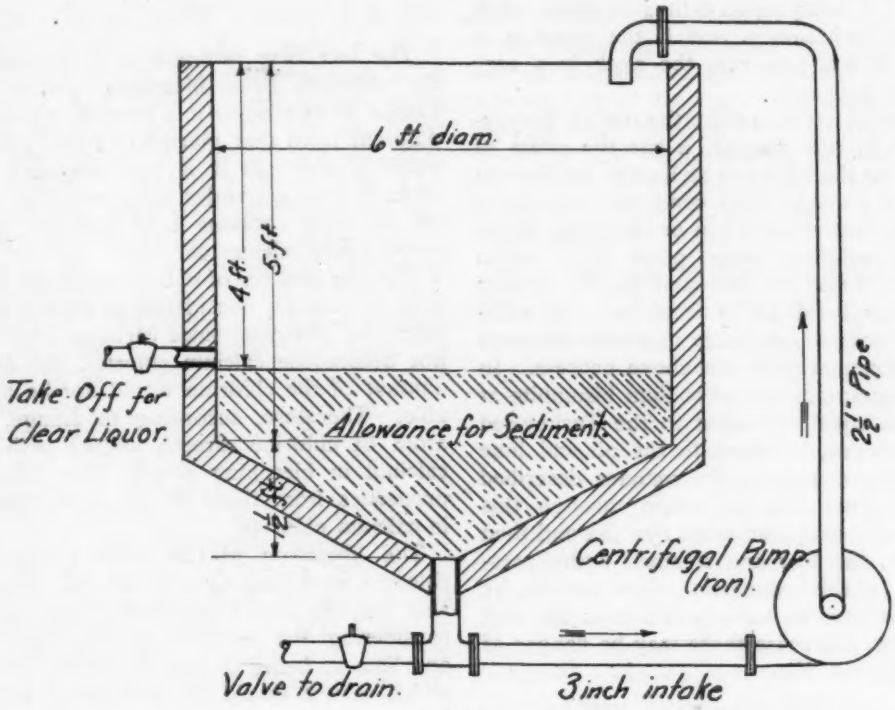


FIG. 1.

Saget more recently has suggested the use of Turkey red oil in place of aniline as being more suitable and efficacious for the purpose of removing the mineral oil stains. In this process the fabric is treated with 5

per cent. of the oil and steamed under pressure, and the spots are then removable by soda lye. The oil may be mixed with the lime or soda liquor used in the kier for boiling-out. It appears to be sufficient for the purpose to use 1 gallon of Turkey-red oil with 500 gallons of caustic soda liquor 2° Be. It is also said that Turkey-red oil and lime work better in the boiling-out than a mixture of the oil and soda. For the preparation of such a liquor slaked lime is mixed with its own weight of oil, and then diluted with water. A milky liquid is thus obtained which settles very slowly, and if the solution is warm it will penetrate the cloth in a very perfect manner.

It would seem that by the use of Turkey-red oil in this manner, it has the effect of removing the oil stains as well as leaving the cloth in a much softer condition. It is also claimed that chlorination or bleaching in the chemic solution takes place in a much shorter period of time and that a weaker bleaching liquid can be employed. An addition of sodium bisulphite may also be made in conjunction with the above process. In this case an amount of sodium bisulphite at 30° Be., equal in weight to the Turkey-red oil employed, is added to the oil and lime mixture prepared in the manner described above. The cloth is passed through this liquor at a temperature of 130° F., and then run into the kier and steamed under pressure. In this connection care should be taken to have all air expelled from the kier by steam, otherwise there may be danger of tendering the fiber.

CONCERNING BLEACHING POWDER

The exact nature and composition of bleaching powder or chloride of lime has long been a matter of conjecture, and it cannot be said that even yet a very definite idea as to its proper constitution has been arrived at. The practical bleacher, however, is always interested in facts relating to the nature and properties of bleaching powder, as in many cases such chemical knowledge may often throw considerable light on some of the mysteries of the bleaching process. A number of years ago Lunge made a very extensive investigation on the nature of bleaching powder with an idea of obtaining some insight as to its molecular structure and chemical composition. In studying its formation by the action of chlorine gas on slaked lime, he arrived at the following equation:

$Ca(OH)_2 + Cl_2 = CaOCl_2 + H_2O$ (or slaked lime + chlorine = chloride of lime + water) and the structural formula adopted for the bleaching powder was:

$$Ca\begin{matrix}\diagup OCl \\ \diagdown Cl\end{matrix}$$

The fact that carbonic acid liberates all the chlorine from bleaching powder led Lunge to ascribe to it a formula somewhat different from that given to ordinary hypochlorite, although it is also admitted that when bleaching powder is dissolved in water the solution contains both calcium hypochlorite and calcium chloride.

The dry powder of chloride of lime, however, cannot be considered as such a mixture. In this case, since carbonic acid cannot decompose calcium chloride, the entire amount of the chlorine would not be available. Therefore, according to Lunge, the atom of chlorine directly united with the calcium in bleaching powder has different properties from those of the same element in calcium chloride.

The liberation of the entire amount of chlorine in bleaching powder by carbonic acid may be better explained, however, by considering the reaction between chlorine and lime as being of the reversible type, in which case it would be represented by the following formula:

$2\,Ca(OH)_2 + 2\,Cl_2 \rightleftarrows CaCl_2 + Ca(OCl)_2 + 2\,H_2O$ (or slaked lime + chlorine $\rightleftarrows$ calcium chloride + calcium hypochlorite + water), thus representing bleaching powder in the same manner as it would be when in solution in water. This is more or less borne out by the fact that the peculiar odor of "bleach" resembles that of free hypochlorous acid rather than that due to the presence of free chlorine.

The reversibility of this reaction will also explain why it is impossible to prepare

bleaching powder containing the theoretical amount of chlorine. On treating bleaching powder with carbonic acid gas, the chemical equilibrium is disturbed; calcium carbonate being formed and hypochlorous acid is set free. This latter reacts with the calcium chloride liberating chlorine and since the latter cannot act upon the calcium carbonate, the reaction goes on until the whole of the calcium in the bleach is converted into carbonate, and the whole of the chlorine is liberated.

With reference to the question of the formation of solid bleaching powder and the bleach solution, it is remarkable that in all reactions characteristic of the former, water plays apparently a very essential role. The best bleaching powder (according to Lunge and Schappi in Dingler's Polytechnic Journal, vol. 237, page 63) is obtained from lime containing 27.5 per cent. of water instead of the 23.5 per cent. which would correspond to the formula of $Ca(OH)_2$. If the lime contains either more or less water, less chlorine will be absorbed. Commercial bleaching powder in fact contains 16 to 17 per cent. of water.

In connection with this action of carbonic acid on bleaching powder it may be said that a solution of bleaching powder is only attacked by carbonic acid at a temperature of 160° F. or over. Bleaching powder itself is decomposed at 160° F. more quickly by moist carbonic acid than by the dry gas, and if the bleaching powder be first dried by having its moisture absorbed over sulphuric acid, it is hardly attacked at all by the carbonic acid.

The chlorine evolved when bleaching powder is decomposed by carbonic acid always contains hypochlorous acid. When a current of moist air is passed over heated bleaching powder it produces calcium chlorate and oxygen, but no chlorine is evolved. But if a current of dry air is used at a temperature of 90° to 105° F., the same products are formed together with chlorine, and at 200° F. most of the available chlorine is removed.

The question as to whether bleaching powder is a mixture of calcium hypochlorite and calcium chloride or a single molecular compound corresponding to an oxychloride is really more of a matter of molecular aggregation than a distinctly chemical difference. Fresenius held that bleaching powder was an ordinary mixture of the two salts, for on treating bleaching powder with successive small quantities of water he found a much larger ratio of calcium chloride to calcium hypochlorite in the first extract than in the last.

Bleaching powder is also hygroscopic like calcium chloride. With respect to its being more stable than the solid hypochlorites of calcium and sodium, the latter have only been prepared from their aqueous solutions and contain much water of crystallization, which no doubt has much influence on their stability. In an anhydrous condition it is highly probable that they would be much less easily decomposed.

PROPER METHOD OF PREPARING BLEACHING POWDER SOLUTIONS

Observations in many mills where solutions of bleaching powder are employed have disclosed the fact that there seems to be little idea on the part of the bleacher relative to the proper and most efficient method of preparing and settling the solutions. This matter has been the subject of some scientific investigation and the results should prove of considerable interest to all cotton bleachers. It is generally supposed that a long period of agitation of the chemic with water is necessary to thoroughly dissolve out all of the available bleaching agent from the powder. Actual tests, however, have shown this view to be quite erroneous. A thorough agitation with water for 15 to 20 minutes will be amply sufficient to dissolve practically all of the available bleach. After 15 minutes' proper agitation there is no increase in the specific gravity of the solution.

The method of agitation is also important and should be carried out with the object in view of breaking up all the lumps of dry powder and giving an intimate mixture with the water. This is usually done by means of rotating paddles in the mixing vat. I have found that a much more efficient method is

to use a centrifugal pump by means of which the entire solution or mixture of water and bleaching powder is circulated. The passage of the material through the pump serves to break up all the lumps of chloride of lime and at the same time cause a very intimate contact of the material with the water which serves to greatly increase the rapidity and efficiency of the solution. A very practical form of such a mixing tank is represented at Fig. 1.

This tank is of cement and is of sufficient capacity for one drum of bleaching powder of 800 pounds. In preparing the solution the tank is first filled to about 8 inches of the top with water, the pump is started, and the chloride of lime is then put in. The circulation is continued for 15 minutes after the chloride of lime has been added. The pump is then stopped, and the solution is allowed to settle for 6 hours.

The solution obtained in this manner will stand at about 9° Tw. and will be in the proportion of about 1 1/2 gallons of water for each pound of chloride of lime.

The volume allowed for sludge should be about 5 cubic feet for each 100 pounds of bleaching powder. Under the conditions given above there will be only about 0.7 per cent. of undissolved available chlorine in the sludge. The outlet pipe for the clear bleach liquor should be arranged at a sufficient height as to allow for the proper volume of the sludge. If this is not the case the time of settling will be so prolonged as to be impracticable. In six hours' time the amount of settling is about 95 per cent. of what it would be in 16 hours, that is to say, after 6 hours the degree of settling is very slow and very slight. The following observation taken under actual mill conditions will illustrate this point:

Time Occupied	Distance Settled Clear
1 hr. 36 mins.	2 ft. 0 ins.
1 hr. 12 mins.	1 ft. 0 ins.
2 hr. 16 mins.	0 ft. 6 ins.
11 hr. 0 mins.	0 ft. 3 ins.

It is thus seen that in 5 hours 4 minutes the liquor settled clear 3 feet 6 inches while in the next 11 hours it only settled a further 3 inches.

Another important factor in the efficient and rapid preparation of bleaching powder solutions is the temperature of the water employed. When the water is cold (50° to 60° F.) the rate of settling is very slow. When the temperature of the water is at 75° to 85° F.) the rate of settling is greatly increased. This is shown by the following tests:

Temp. of water, degrees Fahr.	50	85
Inches settled per hour	6	22
Degrees Tw.	13	12
Cu. ft. of sludge per 100 lbs. chemic..	5.4	2.2

The sludge does not consist of bleaching powder, but of insoluble hydrate of lime suspended in the solution of the bleaching liquor. Under the conditions of settling as given above, about 90 to 95 per cent. of the volume of the sludge will be liquor. From this it may be seen that after all the clear solution of chemic has been run off there is still quite a large amount present in the sludge. This, however, is present simply as the dissolved chemic and not as insoluble matter in the sludge. To extract this residual amount, the vat should be filled up with fresh water and the pump circulated for about 5 minutes. The liquor is then allowed to settle again. In this manner practically 98 per cent. of the available chemic in the bleaching powder may be utilized.

THE PERMANENT FIREPROOFING OF COTTON GOODS

By Dr. William H. Perkin, Manchester, Eng.
Before the International Congress of Applied Chemistry.

(Continued from October.)

Furthermore, in order that it may have a wide application, the process must be cheap. What was really to be aimed at was to treat the flannelette in such a way that it acquired practically the properties of wool which, for all ordinary purposes may be taken as the standard of a safe material. Apart from the other conditions which I have laid down, when one considers the vigor with which the ordinary washerwoman scrubs garments with soap, not infrequently with the assistance of the scrubbing brush, and takes into account the wonderful mechanical appli-

ances now so largely used for washing clothes with the least expenditure of time, it will not be thought surprising that the discovery of a process of fireproofing sufficiently permanent to resist all these conditions seemed to me at first to be almost an impossibility.

In describing the course of the research, I may perhaps be allowed to give a brief sketch of the development of the subject and to outline the reasoning which led to the institution of the various experiments. Some idea of the difficulty of the subject will be gathered when I say that Samuel Bradbury, who so ably assisted me in the work and has kept a record of each experiment, tells me that upwards of 10,000 separate burning tests were made before the solution of the problem was reached. Besides these, a great number of further experiments have since been made to see whether an even cheaper process than that which has now been in commercial use for nearly 10 years could be discovered.

I suppose that everyone would agree that, at the outset of the experiments, the condition which seemed most difficult of realization was that of finding a substance which not only fireproofs but which during the process becomes so permanently fixed that it will prove to be absolutely resistant to washing with soap and water or mechanical rubbing. Obviously the substance which is to fulfil these conditions must, in the first place, be insoluble in water and secondly in order that it is not liable to be removed by mechanical rubbing and does not render the cloth dusty, it must be fixed in the fiber and not be merely on the surface. I have already explained that when calico is dipped in a dilute soiutlon of sodium tungstate, and then dried, the material possesses in a remarkable degree the property of resisting flame and then again alum has often been recommended for the same purpose. Now when solutions of sodium tungstate and alum are mixed, an insoluble aluminum tungstate is produced and it is clear that, if this insoluble salt could be fixed in the fiber, the material would certainly be fireproofed. It furthermore seemed reasonable to suppose that, as the salt is insoluble in water, it would remain in the fiber even after several washings and therefore that permanent fireproofing might be achieved in this manner.

A piece of flannelette was therefore soaked in sodium tungstate and, after passing through rollers, to remove the excess of the solution, left for a considerable time in a solution of alum. It was then squeezed, dried and was passed through the same process again, with the result that the material became almost as fire resistant as asbestos. When, however, the piece was thoroughly washed with soap and water, it was most disappointing to find that the greater part of the fireproofing was removed during the first washing and after several washings, the material was little better than the original flannelette.

While this unexpected result was being investigated, it was noticed that aluminum tungstate is soluble in acetic acid and is reprecipitated when the acetic acid is removed by evaporation or by the action of steam and as the precipitate formed seemed granular in appearance, it was thought that this process, if applied to the flannelette, might yield a better result than the process of double composition had done. Accordingly, a solution was made up of sodium tungstate, aluminum sulphate and enough acetic acid to dissolve the precipitate, the flannelette was thoroughly soaked in this solution, dried and then placed in an ordinary steamer and subjected to the action of steam until the odor of acetic acid could no longer be detected.

The material was, of course, non-inflammable and when it was washed, it was found that this property was distinctly more resistant to soap and water than was the case in the first experiment but after several vigorous washings almost every trace of the fireproofing had disappeared. These negative results seemed therefore to indicate that aluminum tungstate was not suitable for the purpose of permanent fireproofing. On the other hand, the failure of this salt was possibly due to some peculiarities in its specific properties and was not considered valid

evidence that other insoluble tungstates might not combine more completely with the fiber and thus resist removal by washing.

A careful examination of the tungstates was therefore made and such insoluble salts only selected for experiment which, like aluminum tungstate, are colorless since it is obvious that a fireproofing agent to be of any use must be capable of application to white cloth without staining it. Several hundred pieces of flannelette were treated under the most varied conditions with all sorts of combinations which it was known would precipitate insoluble tungstates in the fiber but in no case was a satisfactory result achieved.

However, a fact was noticed which afterwards proved to be of value and it was this that, of all the salts, the tungstates of zinc and tin seemed to offer the most resistance to washing with soap and water. Thus, when the material had been thoroughly saturated with a solution made up of sodium tungstate, zinc sulphate and enough acetic acid to prevent the precipitation of the zinc tungstate, and the goods after drying were thoroughly steamed, the fireproofing was certainly fixed to some extent since it required several washings before the material burnt at all freely. But no amount of variation of the conditions produced a really good result and this combination had therefore to be abandoned. Since the tungstate proved to be unsuitable to the exacting conditions of the problem, a general examination of almost every variety of salt, including ferrocyanides, aluminates, arseniates, antimoniates, zincates and plumbates was made. Many of these could not be employed in connection with wearing apparel in any case because of their poisonous nature but it was thought that this general examination, which lasted several months, might yield some indication of the type of salt likely to prove resistant to soap and water, if, indeed, such type of salt existed at all.

As a matter of fact these experiments did prove to be most valuable because when the results were all tabulated, the generalization gradually became apparent that certain soluble salts such as aluminates, antimoniates, zincates, and plumbates, in which the oxide of the metal functions as an acid, yielded precipitates especially with zinc and tin salts which exhibited much greater resistance to washing than the commoner insoluble salts such as barium sulphate or magnesium phosphate. This generalization ultimately led to a very careful examination of the salts of tin because, as is well known, the oxides of tin dissolve in alkalis to form stannites and stannates and tin therefore belongs to the class of salts just mentioned and it very soon became evident that these salts do actually possess the power of combining with the fiber to a greater extent than any of the salts which had previously been experimented with.

In one experiment it was noted that a piece of flannelette, which had first been saturated with a solution of sodium stannate and dried, and afterwards similarly treated with a solution of zinc chloride, was quite non-inflammable. After the sample had been subjected to a vigorous washing with soap and water a considerable amount of the fireproofing still remained because, when a light was applied to the cloth, it only ignited with difficulty, burned very slowly, and either went out of itself or was easily extinguished on shaking the material.

This development was so promising that the experiment was repeated in a great variety of ways but, although several results were obtained which were much better than anything which had been seen before, it was disappointing to find that in all the cases the greater part of the fireproofing was lost after repeated washings.

In a later series of experiments the first solution was again sodium stannate and the second consisted of sodium tungstate, zinc acetate and sufficient acetic acid to prevent precipitation of the zinc tungstate formed. The result in this case was so good, the material being practically as safe as wool, even after repeated washings, that the first commercial permanently fireproofed flannelette which was placed on the market was made on these lines.

(To be continued.)

FAST COLORS

BY E. S. GRAVES

The textile manufacturer has at his disposal colors, recently discovered, which are as remarkable for their fastness as the cotton colors of the past were remarkable for their fugitiveness. These colors are related to indigo or are applied in a similar manner to indigo and are known as the colors fast to bleaching or the vat dyes. Indigo has been for years the standard of fastness to light for a blue. These colors are much faster than indigo and embrace all shades. It is indeed a revelation to anyone who has followed the color industry to see these colors in light heliotrope, green and mode shades, formerly noted for their fugitiveness, produced so fast that they will withstand the destroying influences of chloride of lime, so fast that they can be sent to the laundry with the request to get them out, and the laundry cannot change them without destroying the cloth. When they are used, the manufacturers are perfectly safe in guaranteeing these colors, and shirtings and a very few dress goods are today so guaranteed. If the color fades the buyer gets a new shirt or a new dress pattern.

For an additional eighth or quarter of a cent a yard the manufacturer can use these colors in place of the cheaper colors. There is little doubt but that the use of these colors will increase as the trade becomes better acquainted with their good qualities. Show me a purchaser who would not gladly pay 5 cents a yard to be insured against a poor dye, that after the first wash looks thin and weak or even runs and after a few washings is so faded that the article in which the color appears is spoiled.

I have talked with many manufacturers on this subject and they tell me that the market is so close that they cannot afford to spend this one-quarter of a cent, and that as long as the jobber, the department store, or distributor and consumer does not know these colors can be obtained and does not demand them, they cannot afford to put them in. This is all wrong. When one buys a piece of colored cloth the assumption is that the color is fast or as fast as the manufacturer can get. It makes such a small difference to the manufacturer and such a great difference to the consumer. I hope the time will soon come when purchasers of colored goods will not buy without a guarantee. Just as there is a pure food law there should be a fast color law; that is, if a manufacturer puts a cheap, inferior color into his goods for any reason, he should be forced to label his goods "colors not fast." It costs the manufacturer a small amount; it costs the man purchaser his shirt or the lady her waist or dress.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 161

YELLOW ON WOOLEN PIECE GOODS

Alizarine Yellow 2G Conc. on 100 lbs. woolen piece goods. Prepare the dye bath with

3 lbs. Alizarine Yellow 2G Conc.
(American Dyewood Company, 80 Maiden Lane, New York.)
20 lbs. Glauber's Salt.
10 lbs. Acetic Acid.

Enter goods at 140° F., bring to a boil in 20 minutes. Boil 1/2 hour and add

3 lbs. Oil of Vitriol.

Boil 1/2 hour longer and add

1½ lbs. Bichromate of Potash.

Boil 1/2 hour and rinse.

Alizarine Yellow 2G Conc. is noted for its level dyeing properties and for its excellent fastness to light.

Recipe No. 162

GREEN ON WOOLEN PIECE GOODS

Alizarine Green B G on 100 lbs. woolen piece goods. Prepare the dye bath with

4 lbs. Alizarine Green B G.
(American Dyewood Company, 80 Maiden Lane, New York.)
20 lbs. Glauber's Salt.
10 lbs. Acetic Acid.

Enter goods at 140° F., bring to a boil in 20 minutes to half an hour. Boil 1/2 hour and add

3 lbs. Oil of Vitriol.

Boil 1/2 hour longer and add

2 lbs. Bichromate of Potash.

Boil 3/4 hour and rinse.

Alizarine Green B G is recommended for its level dyeing properties and its exceptional fastness to light.

Recipe No. 163

OLIVE GRAY ON COTTON YARN

Sulphur Olive 3B on 100 lbs. cotton yarn. Prepare the dye bath with

12 lbs. Sulphur Olive 3B (starting bath).
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
18 lbs. Sodium Sulphide.
5 lbs. Soda Ash.
30 lbs. Common Salt.

Enter at 180° F. and dye at a temperature just below the boil for one hour.

Sulphur Black Brown N R Extra possesses good fastness to all the common color destroying agencies except bleaching.

Recipe No. 164.

DRAB ON COTTON YARN

Sulphur Black Brown N R Extra on 100 lbs. cotton yarn. Prepare the dye bath with

12 lbs. Sulphur Black Brown N R Extra (starting bath).
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
18 lbs. Sodium Sulphide (Conc.).
5 lbs. Soda Ash.
30 lbs. Glauber's Salt.

Enter at 180° F. and dye at a temperature just below the boil for one hour.

Sulphur Black Brown N R Extra possesses good fastness to all of the common color destroying agencies except bleaching.

Recipe No. 165

BLUE ON COTTON YARN

Oxamine Light Blue G X on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Oxamine Light Blue G X.
(Badische Co., 86 Federal St., Boston, Mass.)

Enter at 180° F. and dye at a boil for one hour.

Oxamine Light Blue G X possesses very good fastness to light for a direct cotton color.

Recipe No. 166

BLUE ON WORSTED YARN

Direct Chrome Blue R X on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Direct Chrome Blue R X.
(Badische Co., 86 Federal St., Boston, Mass.)
15 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140° F., bring to a boil and boil for 1/2 hour. Then add

3 lbs. Sulphuric Acid

and boil 3/4 hour longer. Finally add 1 1/2 lbs. Potassium Bichromate and continue the boiling for another half hour.

Direct Chrome Blue R X gives a very desirable shade of navy blue, which possesses excellent fastness.

Recipe No. 167

RED ON WORSTED YARN

Wool Red S3B on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. wool red S3B.
(Geisenheimer & Co., 189 Front St., New York, N. Y.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Wool Red S3B possesses good fastness to light, acids, ironing, and rubbing.

Recipe No. 168

BROWN ON WORSTED YARN

Wool Fast Brown T on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Wool Fast Brown T.
(Farbenfabriken Co., 117 Hudson St., New York, N. Y.)
15 lbs. Glauber's Salt.
5 lbs. Ammonium Acetate.

Enter at about 140° F., raise slowly to a boil, and boil for 1/2 to 3/4 of an hour. Then add

2 lbs. Acetic Acid,

and boil until the bath is exhausted.

Wool Fast Brown T possesses good fastness to steaming, rubbing, alkali, and very good fastness to washing.

Recipe No. 169

BLUE ON COTTON YARN

Diamine Fast Brilliant Blue R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Fast Brilliant Blue R.
(Cassella Color Co., 182 Front St., New York, N. Y.)
20 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Dye for one hour at a boil.

Diamine Fast Brilliant Blue R gives a very bright shade of blue which possesses very good fastness to light.

Recipe No. 170

RED ON WORSTED YARN

Fast Acid Red R H on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Acid Red R H.
(Read Holliday & Sons, 11 Gold St., New York.)
15 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Boil 1/2 hour and add 3 lbs. sulphuric acid. Boil 1/2 hour cold. Add 2 1/4 lbs. chrome and boil for another 1/2 hour.

Fast Acid Red R H possesses excellent fastness to light and milling, which makes it not only suitable for combination with acid colors, but also with milling and mordant colors.

Recipe No. 171

DRAB ON COTTON YARN

Sulphur Black Brown N Extra on 100 lbs. cotton yarn. Prepare the dye bath with

12 lbs. Sulphur Black Brown N Extra (starting bath).
(Berlin Aniline Works, 213 Water St., New York, N. Y.)
18 lbs. Sodium Sulphide, Conc.
5 lbs. Soda Ash.
30 lbs. Glauber's Salt.

Enter at 180° F. and dye at a temperature just below the boil for one hour.

Sulphur Black Brown N Extra possesses good fastness to all of the common color destroying agencies except bleaching.

Recipe No. 172

VIOLET ON WORSTED YARN

Acid Violet 7 B N on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Acid Violet 7 B N.
(Farbenfabriken Co., 117 Hudson St., New York, N. Y.)
15 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140° F., and dye at a boil for one hour.

Acid Violet 7 B N possesses very good fastness to alkali, and good fastness to washing, steaming, rubbing, and stoving.

Recipe No. 173

PINK ON 100 LBS. BLEACHED COTTON YARN

Thio Indigo Rose A N Paste on 100 lbs. bleached cotton yarn. Prepare the dye bath with

1 lb. Thio Indigo Rose A N Paste.
(Kalle & Co., 530 Canal St., New York, N. Y.)
⅔ lbs. Caustic Soda.
¼ lbs. Hydrosulphite Conc. Powder.

The color is reduced at 140° to 160° F., and dyed at temperatures ranging from 100° to 120° F. The reduced liquor is straw yellow in color.

Thio Indigo Rose A N Paste possesses the usual properties of the reduction vat colors.

Recipe No. 174

VIOLET ON BLEACHED COTTON YARN

Benzo-Azurine 3 R on 100 lbs. bleached cotton yarn. Prepare the dye bath with

1½ lbs. Benzo-Azurine 3R.
(Geisenheimer & Co., 189 Front St., New York, N. Y.)
15 lbs. Glauber's Salt.

Dye at a boil for one hour.

Benzo-Azurine 3 R is dyed in a neutral Glauber's salt bath and yields perfectly level dyeings.

Recipe No. 175

SCARLET ON COTTON YARN

Thio Indigo Scarlet S Paste on 100 lbs. cotton yarn. Prepare the dye bath with

20 lbs. Thio Indigo Scarlet S Paste.
(Kalle & Co., 530 Canal St., New York, N. Y.)
4 lbs. Caustic Soda.
3 lbs. Hydrosulphite Conc. Powder.

The color is reduced at 120° to 140° F., and dyed at 60° to 80° F. The reduced liquor is moss green in color.

Thio Indigo Scarlet S Paste possesses good fastness to washing, and fair fastness to rubbing.

Recipe No. 176

GREY ON COTTON YARN

Thio Indigo Grey 2B Paste on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Thio Indigo Grey 2B Paste.
(Kalle & Co., 530 Canal St., New York, N. Y.)
1⅔ lbs. Caustic Soda.
1⅔ lbs. Hydrosulphite Conc. Powder.

The color is reduced at 120° F., and the dyeing carried out at 80° to 105° F. The reduced liquor is yellowish green in color.

Thio Indigo Grey 2B Paste possesses good fastness to washing and rubbing, and fair fastness to light.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

REWARD: As this Department is intended to be a complete record from month to month, we will pay a reward of $2.00 to the person who shall first notify us of any new textile machine, textile device or process, which has been put upon the American market within the two months preceding this issue, and which has not been reported or advertised in the TEXTILE WORLD RECORD. This does not mean an invention which has merely been patented, but something actually ready for sale. A brief description of it and the name of the concern making it should accompany the claim.

Full Fashioned Seamless Hosiery Machine. Max Nydegger, 260 West Broadway, New York, is introducing to the American trade a machine for knitting fashioned seamless hosiery. It is built by the Grosser Knitting Machine Co., whose products are already favorably known in American mills. A description of the machine appears in this issue.

Skein Dyeing Machine. The Acme Dyeing Machine Co., 246 Chestnut St., Philadelphia, Pa. An improved machine for dyeing yarn in the skein.

Dyeing Machine. Samuel Diggle, North Brookfield, Mass., is introducing to American mills the Jean Schmitt automatic machine for dyeing loose material, card sliver and yarn. This machine, which operates by the circulating process, is in successful operation in some of the leading dyeing establishments of Great Britain, France, Germany, Italy, Belgium, Russia and Japan. The machines are built in different sizes, the largest handling about 2,200 pounds at one time.

Cotton Baling. The Modern Gin and Compress Co., Little Rock, Ark. A system of ginning and compressing cotton. The cotton is baled at the gin for shipment to the mill. A much greater density is obtained than with the ordinary method and the new bale is neatly and securely wrapped. About one hundred bales can be loaded on an ordinary freight car.

Oil Filter. The Boston Steam Specialty Co., 332 A St., Boston, Mass. An oil filter by which the oil from engine bearings is filtered and pumped to a storage tank, from which it is fed to the engine bearings, being thus used over and over without waste. This circulating system enables the bearings to be flooded with oil. A large saving of oil is effected, and an even more valuable feature is the perfect lubrication which ensures freedom from damaged bearings and interruption of the engine service.

Woolen Mule. G. Josephy's Erben, Bielitz, Austria. A draft attachment for a woolen mule The roping can be drawn either by stopping the delivery rolls or by running the rolls at a speed below that of the carriage. It is also possible to combine these two methods of drafting.

Mercerizing Hosiery. Bruno Mueller, Chemnitz, Germany. A machine for mercerizing hosiery by a continuous process. The stockings are drawn on a form and then subjected to the mercerizing process.

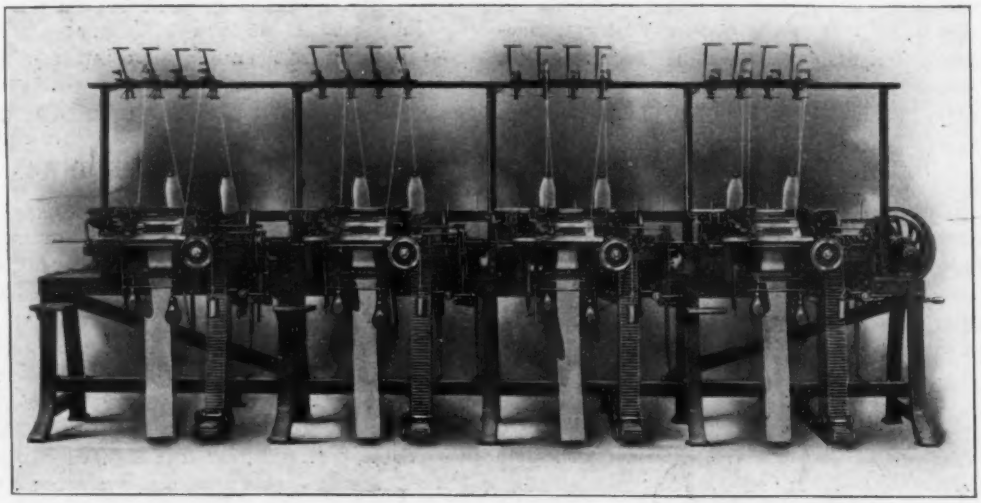
Oiling Wool. Gebrueder Koerting, Linden, Germany. An apparatus for applying oil emulsions to wool during the picking process.

Wool Washing Machine. Charles Delerue, Roubaix, France. An improved machine for scouring wool. It is capable of a large production and leaves the wool in excellent condition.

THE GROSSER FULL FASHIONED SEAMLESS HOSIERY MACHINE

The machine shown in the illustration is built by the G. F. Grosser factory, of which Max Nydegger, 260 West Broadway, New York, is the American agent. It is intended to manufacture in an economical way a fashioned seamless stocking in any desired material or combination of same. It starts the leg at the ankle with a minimum number of needles in operation, knitting a narrow tube with material of a contrasting color before changing automatically to silk, lisle, cotton or wool for the proper article. The automatic shaping follows for the thigh leg by bringing alternately into play additional needles in front and rear needle plate by special mechanism, increasing the diameter of the tube gradually to any required width. In widening, a special stitch is formed when the needle comes into action the first time, thereby avoiding any openings or loose stitches that might be objectionable, particularly in a fine fabric. Once the stocking is fashioned, the machine will automatically increase its speed to approximately 60 revolutions per minute and proceed with the knitting of the tube, eventually changing yarns for the garter top until the desired length is reached. The widening needles are automatically cast off, the widening mechanism reset and the knitting of a new leg begun.

All cam actions are automatic and special provision is made to avoid cast-offs and defective work caused by the passing of large knots or through needle breakage, by an ingenious electric stop motion device which is positive in its action. The pattern chain and chain reducing device are easily accessible, very positive in action and permit quick changes in size and style. To complete the stocking a 3 1/4 inch circular footer is used. The transferring of the legs can be done on transfer rings or directly on the cylinders. This topping work is conceded to be easier than transferring ribs, once the operator is accustomed to it



A FULL FASHIONED SEAMLESS HOSIERY MACHINE.

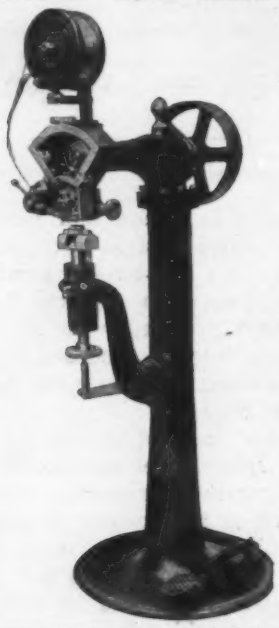
The footer may, of course, be provided with high spliced heel and double sole attachments, thereby producing a high class hose. Welting and looping is done by the usual method for finishing seamless goods. Machines cutting 22 needles per inch have been successfully operated for several years and will knit anything from a 2/40s mercerized to a 6-thread raw silk or a 2/100s combed Egyptian, producing a still finer web than a 39-gauge Cotton patent machine.

One operator can tend from twelve to

twenty heads and the construction of the machines are such that there is very little loss of time on account of repairs. The built-up skeleton needle bed is practically indestructible and accounts for the very small percentage of needle breakage and menders. The hosiery produced by this machine has no seams either in foot or leg and yet is accurately shaped. It has a wide elastic garter top which will not rip. A number of mills in Germany and Austria are operating these machines and have been very successful not only in respect to the economy of manufacturing, but also in producing perfect goods that have proved very popular with the trade.

ATTACHING RIDER TICKETS

The illustration shows the Monitor textile stitcher for attaching rider tickets. It is built by the Latham Machinery Company of New York, Chicago and Boston. The capacity of the machine is stated to be in the neighborhood of 10,000 tickets in eight hours. It may be run by a $5.00 a week operator. If two operators were employed on one machine the capacity is doubled, much depending upon the skill of the operators. In some cases as high as 25,000 tickets have been attached in eight hours.



THE MONITOR TEXTILE STITCHER.

The machine is driven by a belt and the staples are formed from a spool of wire and cost less than 1 cent per thousand. An important feature claimed is that the staple does not tear the threads in the goods nor injure the fingers when removing the tickets.

A number of hosiery mills are using these machines, one large concern employing nine, others use from one to four machines.

The Latham Machinery Company offers to stitch up 100 samples without any expense to any concern that desires to investigate this method of attaching rider tickets.

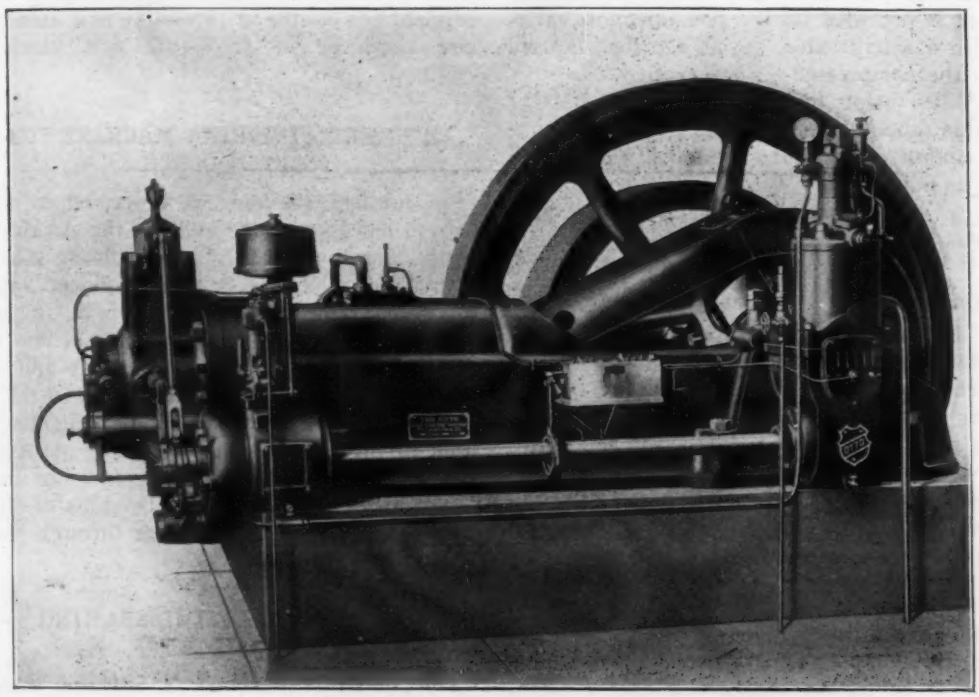
THE OTTO CRUDE OIL ENGINE

The Otto crude oil engine, shown in the illustration, is of the Diesel internal combination type and will operate with the greatest possible economy not only on crude oil, but also on the residual products obtained in refining crude oils, as well as on the by-products of gas and coke manufacturing plants. It is built by the Otto Gas Engine Works, 33 Walnut St., Philadelphia, Pa., and is the first horizontal type built in the United States. The advantages which explain the success of this type of engine are due to an entirely new principle of handling liquid fuels of low degree, such fuels as have not heretofore been converted into power without the use of expensive and complicated auxiliary apparatus for the purpose of vaporization. The Otto engine uses these fuels in their simplest, safest, least expensive and most generally available form, and its efficiency is so far ahead of that of any other prime mover, not only steam, but also any ordinary type of internal combustion engine, that the degree of economy obtained in employing these cheap fuels is remarkable. Crude oils and residual oils obtained in refining mineral oils of all kinds are available at prices ranging from 2 1/2 to 4 cents per gallon, according to the distance from the oil fields to the destination of shipments. Considering that the Otto crude oil engine develops a brake horsepower hour on 1/15 of one gallon of these fuels, it will be seen

that the fuel cost per brake horsepower per hour is from 1/6 to 1/4 of a cent.

The absence of all auxiliary apparatus limits the space required for the installation to that occupied by the engine itself, an important factor in densely populated and manufacturing districts. The attention necessary for the operation of the Otto is of the simplest nature. Being started by compressed air, one man can easily handle it, and after it is once set in motion its care requires no greater amount of labor than that of the ordinary type of gas and gasoline engine. The addition of the air compressor for furnishing the pressure under which the fuel is injected is compensated by the elimination of ignition apparatus of any kind whatever, a feature which commends itself, considering that probably 75 per cent. of the troubles experienced in the operation of gas or oil engines are due to the igniter, magneto, battery or coil.

The horizontal Otto crude oil engine is of the single acting type and operates on the Otto or four-stroke-cycle principle, invented by the late Dr. Nicholas A. Otto. Every kind of low-grade fuel is used, such as crude oil, gas oil, solar oil, tar oil and similar oils, and with the same degree of reliability and economy. The cycle of operations is as follows: During the first outward stroke of the piston, a charge of pure air is admitted into the cylinder through the inlet-valve. This air is compressed during the succeeding inward stroke until its temperature exceeds the temperature at which the fuel ignites. The latter is injected into the heated air at the end of the compression stroke, ignited spontaneously by the highly heated air in the cylinder produced by the compression stroke, and burns steadily for a part of the expansion stroke. Sudden variations in pressure are avoided in this engine. The spent gases are expelled through the exhaust valve and port during the succeeding return stroke.



THE OTTO CRUDE OIL ENGINE.

The quantity of fuel injected into the cylinder by the oil pump is automatically regulated by the governor to conform to the load

carried by the engine at any time, which is done by varying the closing of the by-pass valve in the overflow chamber. The engine is started by means of compressed air at low pressure, supplied from a reservoir which is filled from the air compressor on the engine; the admission of the air into the cylinder being controlled by the mechanically operated starting valve. A low-pressure safety valve, set at 220 lbs., is placed on the compressor, and high-pressure safety valve, set at 1200 lbs., is provided on the fuel injection valve. Also a safety valve, set at 220 lbs., is used on the compressed-air reservoir.

When using fuel oils of average heating value (about 18,000 B. t. u. per lb. the consumption of the Otto crude oil engine will be as follows:

Load	Per B. h. p. per hour
Full	50 lbs.
Three-quarter	56 lbs.
One-half	62 lbs.
One-quarter	74 lbs.

The variation in the speed of the engine between full load and idle running does not exceed 6 to 8 revolutions per minute, or less than 4 per cent. On special electric engines the size and weight of the fly wheel is proportioned so as to keep the cyclical variation in speed within limits which will result in regularity being obtained within 3 per cent. each way, from mean rated speed with gradual change of load.

There are today in use in Germany and other European countries between 33,000 and 36,000 h. p. of Otto-Diesel engines. This type of engine has been built at the Otto works in Cologne for many years. The first model was exhibited twelve years ago at the Paris Exhibition. The Otto Gas Engine Works have had the benefit of the twelve years' practical experience of the engineering staff of the German plant, which with complete drawings as a further guide assure them success from the outset. As an illustration of the careful designing, machining and assembling which enter into the construction of the Otto crude oil engine, it is interesting to know that the first engine tested operated successfully without a hitch the first time it was started. Since then the engine has been running under load on all sorts of low-grade oils. Perhaps the severest test thus far has been a long run on a heavy oil containing 6 per cent. asphaltum. This oil is so thick a larger pipe had to be used to convey the fuel from the tank to the fuel pump. The engine developed the same horsepower with this oil as with lighter oils, and showed almost complete combustion.

It is interesting to note that while the Otto Company is the first to build the horizontal type of Diesel engine in this country, they have also had first honors in developing the original gas engine in 1876—the first anthracite producer in 1903—the first alcohol engine in 1906.

AN EMERY FINISHING MACHINE FOR COTTON CLOTH

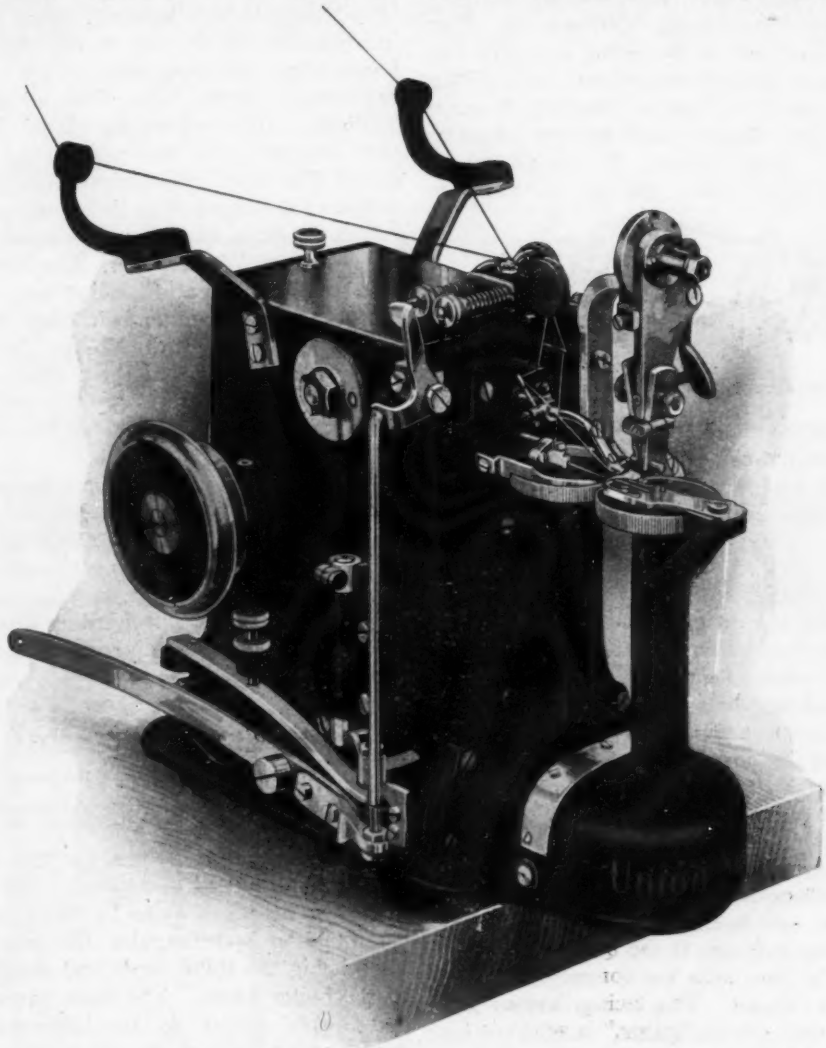
In our October issue we described an improved emery machine built by the A. Monforts Maschinenfabrik, M.-Gladbach, Germany, and which is being introduced into this country by L. H. A. Schwartz & Co., 50 Central St., Boston, Mass. This machine is especially adapted for cotton goods and is installed in many of the leading cotton mills of Germany, where it is giving excellent results in the cleaning and finishing of print cloths and all cotton fabrics requiring the action of an emery roll. Both sides of the goods are treated at each run through the machine.

A NEW SELVAGE EDGE SEAMING MACHINE

The illustration shows a selvage edge seaming machine recently brought out by the Union Special Machine Co., 300 W. Kinzie St., Chicago, Ill. This machine, which will be known as Class No. 41,000 is a cup feed machine designed to run at high speed. It makes the flat double thread Interlock seam, thus doing away with the ridgy seam frequently noticed in full fashioned hosiery. Another valuable feature of this machine is that it produces a looper finish, the threads forming the seam being chained out at the end of the seam, which is thus tied, preventing the ripping back which has caused great trouble to manufacturers. The new machine is suited for a wide range of work from the finest silk fabric to the

heaviest rib top cotton hosiery. Special machines are made to suit any grade of work. The machine is provided with an improved adjustable uncurling device which ensures a perfect seam. Both the feeding cups are driven positively, thus preventing any tendency of the seam to pucker. An easily adjustable stitch device is supplied with this machine, rendering it unnecessary to change parts when changing the length of the stitch, as has heretofore been the case.

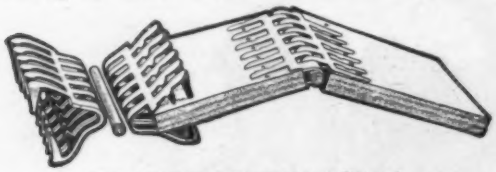
The machine is controlled wholly by the foot of the operator and the work can be removed without the operator turning hand wheel to set the needle in position. This enables the work to be removed from the machine without the seam being ripped or raveled back. The machine is built of the best materials and with the high standard of workmanship for which the Union Special Machine Co. has earned an enviable reputation.



UNION SPECIAL SELVAGE EDGE SEAMING MACHINE.

ALLIGATOR STEEL LACING

The Alligator steel belt lacing shown in the accompanying illustration, is manufactured by the Flexible Steel Lacing Co., 542 W. Jackson Boulevard, Chicago, Ill. The teeth on each side of the lacing enter the belt on different lines of perforation; each prong has two teeth, the longer clinching through the belt, the shorter point on the opposite side of prong giving great additional strength. Both enter the belt so that the



THE ALLIGATOR STEEL BELT LACING.

pull is against the edge of the steel and not against the flat as in other kinds of steel lacing. This avoids weakening the belt, and in rubber and textile belts does not cut the long threads in which lie the strength of that class of belting.

Being separable, this lacing is especially adapted for use on overhead belts, the ends can be dropped down, the lacing applied and hinge pin inserted after the belt is returned to the shafting; by taking out pin, the belt may be temporarily removed from service, lengthened by inserting a stub section of belting or shortened by cutting off the excess from one end and using half of a new lacing.

The illustration shows at the right two ends of belting laced ready for use, while at the left the steel lacing is shown as it appears before being fastened in the belt. After it is fastened the two ends are connected by the steel pin as shown. This lacing, known under the trademark "Alligator," is adapted for leather, rubber, balata or canvas-stitched belting. The flexible joint ensures quick contact with the pulley whether the belt is run with either or both sides in service. The lacing engages both sides of the belt and the strain is thus thrown in direct line of the pulley. When applied according to the directions the manufacturer states that the lacing will stand severe strain under hard conditions of service. A hammer is the only tool required and the simplicity of application insures an important saving of time.

No punch holes are required and it works perfectly in contact with an idler pulley. One factory in Chicago formerly using wire lacing has reduced the cost of material for belt joints 50 per cent. and saved 75 per cent. time required to repair belts since adopting the "Alligator" throughout the plant. This factory employs over 400 people and has reduced this item of expense while enlarging the plant and increasing their output.

The Testing Works and Chemical Laboratories in Westminster, England, made tests of the "Alligator" lacing and reported that a four-inch medium belt, which had been fastened together with No. 25 "Alligator" steel lacing, came from the testing machine, having stood a strain of 3,360 pounds, when the rawhide pin sheared and tore out one hook of the lacing.

Another test made in extra heavy single leather belting four inches wide, came from the testing machine with the belt partly torn off at the fastenings, having had a strain of 3,248 pounds applied.

Further information regarding this flexible steel lacing can be obtained from the manufacturers.

A LINEN WEAVING MILL

From Uhlands Technische Rundschau

Translated from the German by the Editor of the Textile World Record.

The accompanying plan is for a linen weaving mill having 169 looms. The ground plan is so arranged as to be easily enlarged. The building is rectangular, the only projections being the toilet room and the entrance to the boiler house. The main entrance, A, gives easy access to the different work rooms and egress in case of accident. The building has a saw-tooth roof throughout, running crossways of the building and at right angles to the shafts of the looms. The roof is built of wood and iron and rests on iron posts. In summer the rooms are easily ventilated by opening the windows in the roof and in winter ventilation is obtained by a forced draft of hot air. The distances between posts lengthways of the mill are as

Fig. 1

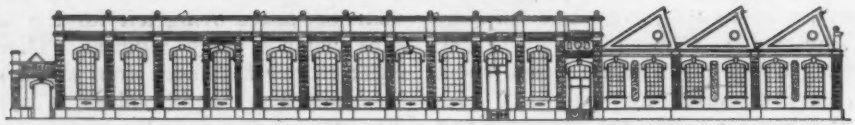


Fig. 2

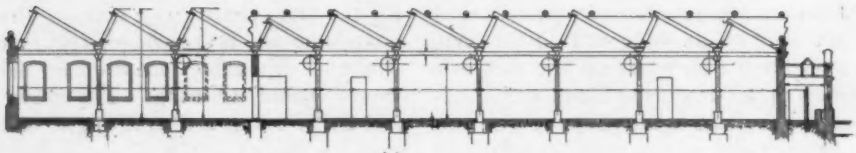


Fig 3

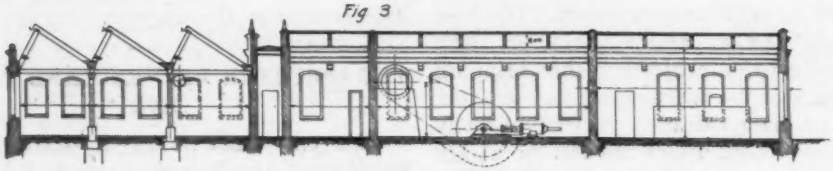


Fig. 4

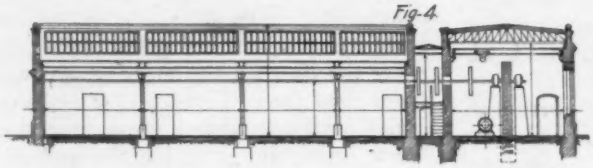


Fig 5

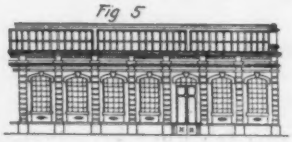


Fig. 6

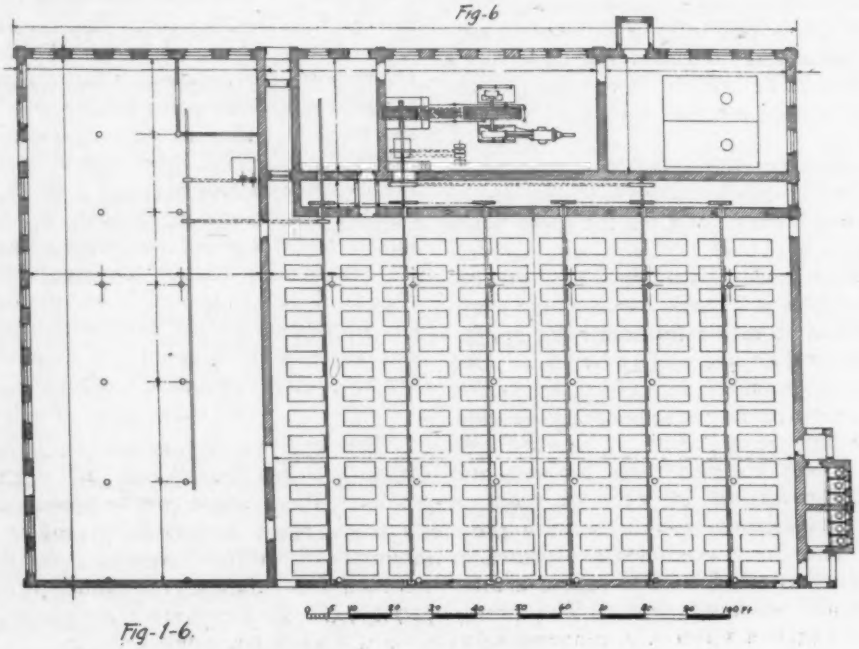


Fig. 1-6.

follows: 3 by 23 ft., 1 by 16.6 ft., 2 by 18 ft.; crossways, 3 by 18.4 ft., 1 by 14.8 ft., 2 by 19 ft., 1 by 19.7 ft., 1 by 19 ft., 1 by 14.4 ft. The setting of the posts in the weave room gives plenty of space for alleyways. As shown at Fig. 6 the looms are driven by half turned belts, this method having been found to offer special advantages.

Eight looms are set between posts. The looms are each 96 in. wide and 50 in. deep, and are set 19 1/2 in. apart on the weaver's side and 16 in. apart on the beam side. Between each two posts is an alleyway 5 1/4 ft. wide. At each end of the room is a row of looms 118 in. wide for wide goods. The roof beams are 14.8 ft. above the floor. The posts have a 19 in. projection, thus bringing the bearings of the shaftings 13 ft. above the floor. The main entrance, A, leads directly to the weave room where the 168 looms are arranged in six groups, each consisting of two rows. Access from the weave room to the more important rooms of the mill is obtained by a number of iron doors.

The preparatory processes are carried on in room, K^1, while the room, K, is used for shipping. The repair shop, C, is connected with the weave room by a passage, D^1, through the beltway, D. The forward part of the beltway is used as a wardrobe and a washroom. The beltway at the right of the passage is used for the storage of weaving utensils.

The preparatory room, K^1, contains three warp spooling machines, each having eighty drums with a gauge of 8 in., the spool heads being 5 in. in diameter. Each spooler occupies a floor space of 5.9 by 56.6 ft., and requires 1 1/2 h. p. There are also four warpers 4.5 ft. wide with a frame for 700 spools, occupying a floor space of 12 by 19 ft. One machine is provided for every 40 looms. There are two sizing machines 4.5 ft. wide, each machine being calculated to supply 80 looms. There are also three beamers and three filling winders. Plenty of room is available for examining and measuring the pieces. The sizing machines are placed in the enclosed room, K^2. The offices are located in the shipping room. The power house, E, contains a 120 h. p. compound engine which has only a high pressure cylinder installed, space being left for the low pressure cylinder when required. There is an eight-groove fly wheel from which power is transmitted by eight cables, 1 1/2 in. in diameter, as shown in the plan.

The engine runs at 80 strokes per minute, giving a speed of 140 revolutions per minute for the main shaft. The counter shaft in the power house is provided for driving the dynamo. Six cables are used for driving the weave room shafting. The power house and boiler room are 20 ft. high. A mounted crane is placed in the power house to facilitate repairs to the engine.

THE SOUTHERN NEW ENGLAND TEXTILE CLUB

This club held its twenty-sixth monthly meeting at the Narragansett Hotel, Providence, R. I., on Oct. 19, over one hundred and fifty members and guests being present. After the banquet the meeting was called to order, and Judge Head of the Indiana Federal Court delivered a very interesting address. After the speaking the audience was entertained by cabaret singers and vaudeville artists from Boston. Frederick Howe of the Crompton & Knowles Loom Works called attention to the failure of a large number to attend the dinners after having notified the secretary that they would be present. As a result the club had been compelled to bear the expense of banquets for a much larger number than were in attendance. Senator Dixon and John Burton, superintendent of the Nashawena Mills, New Bedford, made suggestions as to a remedy for the difficulty and on motion of Mr. Burton the president was authorized to appoint a committee of five to consider and report upon the matter.

There are 35 cotton spinning companies in Japan having 1,720,675 ring and 36,124 mule spindles, the average counts produced being 21.2 on rings and 60.8 on mules. The amount of cotton consumed in the six months from January to June, 1910, was 272,714,960 lbs., compared with 250,532,829 lbs. in the last six months of 1909.

Personals

Harry Swingelhurst, who has been associated with the firm of Scott & Williams for many years in very important positions and who is well and favorably known in the knitting trade, has just been appointed General Superintendent of their works at Laconia, N. H., to take the place of F E. Mellor, who resigned.

R. B. Brown has accepted the position of overseer of spinning at the Brandon Mills, Greenville, S. C.

W. E. Poag has accepted the position of overseer of carding at the Manetta Mills, Lando, S. C. He formerly held a similar position with the Cannon Mfg. Co., Concord, N. C.

J. J. Elliott has accepted the position of overseer of carding at the Bibb Mfg. Co., Macon, Ga.

J. H. Perkins has succeeded J. J. Elliott as overseer of carding at the Monroe Cotton Mills, Monroe, Ga.

R. L. Poovey has been appointed superintendent of the No. 4 Mill of the Marlboro Mills, McColl, S. C. He comes from Charlotte, N. C.

A. L. Burt has accepted a position as overseer of weaving at the Covington Mills, Covington, Ga. He was formerly employed at Siluria, Ala.

J. W. Outz, superintendent of the Shaw Cotton Mills, Weldon, N. C., has resigned to accept a position with A. H. Washburn of Charlotte, N. C.

C. R. Lockman has accepted the position of overseer of spinning at the Loray Mills, Gastonia, N. C. He comes from Bessemer City, N. C.

E. C. Herron has accepted the position of overseer of spinning at the Appalache Mills, Arlington, S. C. He was formerly employed at Gastonia, N. C.

M. R. Vick has been appointed superintendent of the Little River Mfg. Co., Willardville, N. C. He comes from Roanoke Rapids, N. C.

H. V. Deaver has accepted the position of overseer of carding at the Great Falls Mfg. Co., Rockingham, N. C. He was formerly employed at Dillon, S. C.

John Mahoney succeeds W. F. Fowler as overseer of dyeing at the Locke Mill, Concord, N. C.

W. H. Hearne, overseer of spinning at the Richland Mill, Columbia, S. C., has resigned to become superintendent of the new Johnston Mfg. Co., Charlotte, N. C.

B. E. Connell, overseer of weaving at the Faulkner Mfg. Co., North Billerica, Mass., has severed his connection with that company.

H. S. Mowry, overseer of finishing with the Waterhouse & Howard Mill, North Adams, Mass., has resigned to accept a similar position with the Arlington Mill, Lawrence, Mass.

Dan Furlong has accepted the position of overseer of carding for A. Howarth & Sons, Oxford, Mass. He was formerly employed at the Wilton Woolen Mill, Wilton, N. H.

J. H. Ryder, Jr., has accepted the position of overseer of finishing for the Waterhouse & Howard Mill, North Adams, Mass. He comes from South Hadley Falls, Mass.

Albert Brown has been promoted to the position of overseer of spinning at the North Adams Mfg. Co., North Adams, Mass.

Amedee J. Dupuis has accepted the position of sewing machine fixer for the Thomas Dalby Co., Watertown, Mass. He was formerly employed at Tippecanoe City, O.

William Hurtley, overseer of spinning at the North Adams Mfg. Co., North Adams, Mass., has severed his connection with that company.

Joseph F. Linberg has accepted the position of second hand in the dye house at the Odsonia Mills, Jamestown, N. Y.

A. B. Benson, superintendent of the Jenckes Spinning Co., Pawtucket, R. I., has resigned to accept a similar position with the Nonquit Spinning Co., New Bedford, Mass.

Joseph Shaughnessy has accepted the position of overseer of finishing at the Montrose Woolen Co., Woonsocket, R. I. He was formerly employed at the Wesserunsett Worsted Co., Skowhegan, Me.

L. W. Quealy, superintendent of the Boston Mfg. Co., Waltham, Mass., for a number of years, has been appointed agent of the Salmon Falls Mfg. Co., Salmon Falls, N. H.

George Giffin, agent of the Faulkner Mfg. Co., North Billerica, Mass., has severed his connection with that company.

Harry Balcomb has accepted the position of overseer of carding for Charles Davis & Co., Northfield Falls, Vt. He was formerly employed at the Great Falls Woolen Co., Somersworth, N. H.

Martin O'Toole, overseer of finishing at the Montrose Woolen Co., Woonsocket, R. I., has severed his connection with that company.

T. H. Plouff has accepted the position of overseer of finishing for Joseph Greer, Emerald Mill, Philadelphia, Pa. He was formerly employed at the Kent Mfg. Co., Centreville, R. I.

Warren E. Holland has accepted the position of assistant superintendent of the Ponemah Mill, Taftville, Conn. He was formerly employed at the Dartmouth Mill, New Bedford, Mass.

Arthur Willman has been appointed assistant superintendent of the Bigelow Carpet Co., Clinton, Mass. He comes from the Lowell plant of the Bigelow Carpet Co.

Edmund Evans has accepted the position of overseer of finishing at the Hadley Mills, South Hadley Falls, Mass. He formerly held this position.

Gladstone Fish has been appointed overseer of weaving at the Fort Dummer Mills, Brattleboro, Vt. He comes from Fall River, Mass.

A. B. Tebo, second hand in the carding department at the Totokett Mfg. Co., Versailles, Conn., for a number of years, has severed his connection with that company. He is succeeded by Edward Davingnon of Taftville, Conn.

Fred Williams, overseer of dressing at the Premier Worsted Mill, Pascoag, R. I., has resigned to accept a similar position with the United States Worsted Co., Lawrence, Mass.

Sydney R. David, representing F. E. Atteaux & Co., dealers in dye stuff, has severed his connection with that company.

W. H. Yount has been appointed overseer of carding at the Hanover Woolen Mfg. Co., Hanover, Ill. He comes from Napoleon, O.

Henry Ensling, overseer of spinning, spooling and warping at the Shetucket Co., Norwich, Conn., has severed his connection with that company.

George Dickey, overseer of weaving at the Fort Dummer Mills, Brattleboro, Vt., has severed his connection with that company.

H. B. Hooper, purchasing agent for the Glenlyon Dye Works, Saylesville, R. I., has resigned. He has been in their employ for the past ten years.

C. N. Bagley has been appointed superintendent of the Jefferson Mfg. Co., Jefferson, Mass., to succeed James Sullivan. Mr. Bagley was formerly employed at Quinebaug, Conn., for a number of years.

William Jowett, overseer of dyeing at the Plainfield Woolen Co., Central Village, Conn., for a number of years, has severed his connection with that company.

F. Austin has accepted the position as overseer of dyeing at the Plainfield Woolen Co., Central Village, Conn. He was formerly employed at the Namquit Worsted Co., Bristol, R. I.

W. S. Lowe, who has been superintendent for the Geo. H. Tilton Hosiery Co., has been transferred to their mill at Savannah, Ga.

Charles G. Voss has been appointed superintendent of the No. 2 Mill of the Deep River Mills, Randleman, N. C.

Orrin Johnson, overseer of dyeing at the Delgado Mill, Wilmington, N. C., has resigned.

G. B. Hamby, overseer of weaving at the Delta Mills, McComb City, Miss., has resigned.

Ben Nuttall has accepted the position of overseer of carding at the Eagle & Phoenix Mills, Columbus, Ga. He was formerly employed at Munford, Ala.

J. M. Freeman has accepted the position of overseer of weaving, slashing and cloth room at the Ivey Mill, Hickory, N. C. He was formerly employed at Henrietta, N. C.

F. P. Turner has accepted the position of assistant superintendent at the Graniteville Mfg. Co., Graniteville, S. C.

F. H. Whisnant has accepted the position of overseer of carding and spinning at the Huss Mill, Bessemer City, N. C., succeeding Marx Helms.

J. B. Harris has accepted the position of overseer of spinning at the Green Mfg. Co., Greer, S. C. He was formerly employed at Greenwood, S. C.

A. T. Nuttall has accepted the position of overseer of carding and spinning at the Pee Dee Mills, No. 2, Rockingham, N. C.

Richard A. O'Donnell has accepted the position as overseer of dyeing at the Pondicherry Co., Bridgton, Me. He was formerly employed at the Dumbarton Woolen Co., Dexter, Me.

Thomas Angus, overseer of finishing at the New York Mills, New York Mills, N. Y., has severed his connection with that company.

Harry L. Munz, until recently a member of the firm of H. L. Munz Co., manufacturers of silk hosiery, has resigned to accept a position as superintendent of the Blue Ridge Knitting Mill, Hagerstown, Md.

A. J. Pradle, designer for the Montrose Woolen Co., Woonsocket, R. I., has been appointed superintendent to succeed Jacob Hary. Mr. Hary has been in poor health for some time and will retire from active management of the mill for the present.

J. L. Curley has accepted the position of overseer of spinning at the Harborough Mills, Bessemer City, N. C.

J. C. Kooner has accepted the position as overseer of spinning at the Patterson Mills, Roanoke Rapids, N. C. He was formerly employed at Spray, N. C.

J. J. Ward has been appointed superintendent of the Dixie Cotton Mills, LaGrange, Ga. He formerly held a similar position at Warrrensville, S. C.

H. L. Fowler has accepted the position of overseer of carding and spinning at the Deep River Mills No. 2, Randleman, N. C.

J. C. Tiddy has accepted the position of overseer of spinning at the Amazon Mill, Thomasville, N. C. He was formerly employed at Dillon, S. C.

Gordon A. Johnson has been appointed agent of the Fulton Bag & Cotton Co., Atlanta, Ga. He was formerly employed as superintendent and agent of the Danielson Cotton Co., Danielson, Conn.

Charles Ward, superintendent for Samuel J Aronsohn, Inc., manufacturers of tie and dress silks, Paterson, N. J., has severed his connection with that company.

George Sands has accepted the position of overseer of carding at the Corinna Mfg. Company, Corinna, Me. He was formerly at Wilton, Me.

Albert Mann, president and treasurer of the Keystone Plush Co., Camden, N. J., has severed his connection and has moved to Pike, N. Y., where he has secured a position with the Genesee Textile Co.

John Magner has accepted the position of overseer of dyeing at the Dumbarton Woolen Co., Dexter, Me. He comes from Providence, R. I.

William Miller, superintendent of the Marlboro Mill No. 3, McColl, S. C., has severed his connection with that company to accept a position as overseer of carding at the Hartsville Cotton Mill, Hartsville, S. C.

Jock Purdon has accepted the position of second hand in the dye house at the Namquit Worsted Co., Bristol, R. I.

Robert S. Dodds has been appointed overseer of weaving at the Faulkner Mfg. Co., North Billerica, Mass. He was formerly employed at the Adams Woolen Co., Adams, Mass.

Edward Dempsey has accepted the position of overseer of weaving at the Intervale Mills Corporation, Quinebaug, Conn. He was formerly employed at Hope Valley, R. I.

Edward H. Heine has accepted the position of overseer of weaving at the Reliance Worsted Co., Norwich, Conn. He was formerly employed at the Somerset Woolen Co., Monson, Mass.

John Martin, overseer of weaving at the Reliance Worsted Co., Norwich, Conn., has resigned to accept a similar position at the Lymansville Co., Lymansville, R. I.

George Berg has accepted the position of second hand in the finishing department for the Patrick Duluth Woolen Mill, Duluth, Minn. He was formerly employed at the Woolen Mfg. Co., Beaver Dam, Wis.

Henry Murphy, assistant superintendent at the Anco Mill, Wilkinsonville, Mass., has resigned to accept a position as superintendent of the automobile tire cloth weaving at the Bibb Mfg. Co., Macon, Ga. On his retirement at the Anco Mill Mr. Murphy was presented with a dress suit case, a traveling case, a diamond ring and Knights of Columbus charm.

Joseph Gagne, assistant foreman of the spooling, warping and spinning departments at the Waypoyset Mill, Central Falls, R. I., has resigned to accept a position as overseer of spinning in a large mill at Taunton, Mass.

William A. Howarth, overseer of weaving at the Interlaken Mill, Harris, R. I., has severed his connection with that company after twenty years of service.

Andrew Smith, overseer of carding at the Berkshire Mill No. 4, Adams, Mass., has resigned to accept a similar position in a large mill in New Bedford, Mass.

James Reynolds has been appointed superintendent and designer for the Elmville Worsted Co., Elmville, Conn., succeeding Abe Miller.

William E. Chamberlin, overseer of finishing at the Bay State Worsted Co., Worcester, Mass., has severed his connection with that company.

George B. Dixon, overseer of carding at the Merrimac Hat Co., Amesbury, Mass., has resigned to accept a similar position at the Great Falls Woolen Co., Somersworth, N. H.

A. F. Shaw, superintendent of the print works of the Apponaug Co., Apponaug, R. I., and George Moeller, overseer of the printing department, are to sever their connections with that company on or about November 1.

C. H. Warfield, secretary and treasurer of the Goulds Mfg. Co., Seneca Falls, N .Y., who manufacture pumps and hydraulic machinery, has severed his connection with that company. He is succeeded by D. R. Wells as treasurer and by H. S. Fredenberg as secretary.

Robert Hutton has been appointed designer at the Vassalboro Mill, American Woolen Co., North Vassalboro, Me. He was formerly employed at the Oakland Mfg. Co., Reisterstown, Md.

William S. Dean has been appointed assistant in Agricultural Technology, Dept. of Agriculture, Bureau of Plant Industry, Washington, D. C. He formerly held a position as overseer of carding at the Locke Cotton Mills, Concord, N. C.

Robert L. Pope has been promoted from overseer of carding and spinning to the position of superintendent of the Munford Cotton Mills, Munford, Ala.

E. T. Barnes has accepted the position of overseer of spinning at the Fairfield Mill, Winnsboro, S. C. He previously held a position as night superintendent of the Echota Mill, Calhoun, Ga.

J. M. Short has accepted the position of overseer of carding and spinning at the Dilling Mill, Kings Mountain, N. C.

William G. Henderson has been appointed general manager of the Hamilton Carhartt Cotton Mills, Rock Hill, S. C. He was formerly employed at Hope Hills, N. C.

George W. Dearman has accepted the position of overseer of spinning at the Manetta Mills, Lando, S. C.

J. W. Nipper has been appointed superintendent of the Palmetto Mills, Columbia, S. C.

T. A. Reynolds has accepted the position of overseer of carding and spinning at the Putnam Mills & Power Co., Eatonton, Ga.

Wade Hammonds has accepted the position of overseer of carding at the Palmetto Mills, Columbia, S. C.

R. B. Riddle has accepted the position of overseer of spinning at the Brookford Cotton Mills, Brookford, N. C. He comes from Charlotte, N. C.

C. H. Hammond has accepted the position of overseer of carding at the Springstein Mills, Chester, S. C. He was formerly employed in a

similar position at the Fidelity Mills, Charlotte, N. C.

P. M. Keller has been appointed superintendent of the Prendergast Cotton Mill, Prendergast, Tenn. He was formerly employed at Kings Mountain, N. C.

Mahlon L. Seidel, for many years a buyer of men's clothing for Dives, Pomeroy & Stewart, of Reading, Pa., will take an active interest in the future in the management of the Maidencreek Hosiery Co. Mr. Seidel has been president of the hosiery company for the last five years.

Arthur Willman has been appointed assistant superintendent of the weaving department at the Bigelow Carpet Co., at Clinton, Mass. He comes from the Bigelow Carpet Co., of Lowell, Mass.

I. Parmenter has been appointed overseer of carding at the Salmon Falls Mfg. Co., Salmon Falls, N. H., succeeding J. C. Lewis.

David T. Black has accepted the position of designer at the Hanover Woolen Mfg. Co., Hanover, Ill.

Ben Parker has succeeded M. M. Coggins as overseer of spinning at the Fountain Inn Mfg. Co., Fountain, Inn.

Joshua Cuttle, for the past three years overseer of dyeing at the Merrimac Hat Co., Amesbury, Mass., has severed his connection with that company.

James B. Smith has accepted the position of overseer of dyeing at the Merrimac Hat Co., Amesbury, Mass.

A. L. Ellis has accepted the position of overseer of spinning at the Jackson Mills, Iva, S. C.

J. E. Jones has accepted the position of overseer of weaving at the Brookford Mills, Hickory, N. C. He formerly held a similar position with the Delgado Mills, Wilmington, N. C.

E. Faulkner, formerly of Mobile, Ala., has accepted the position of overseer of weaving at the Georgia Mills, No. 2, Griffin, Ga.

C. K. Taylor, manager of the Natchez Cotton Mills, Natchez, Miss., has resigned to accept the position of assistant manager and superintendent of the Selma Mfg. Co., Selma, Ala.

F. T. Newberry, overseer of the weaving, slashing and cloth rooms at the Magnolia Mills, Magnolia, Miss., has resigned to accept a similar position with the Selma Mfg. Co., Selma, Ala.

Henry Howard has been appointed superintendent and manager of the Trainer Spinning Co., Chester, Pa. He formerly held the position of overseer of spinning at the Payne Mills, Macon, Ga.

W. C. Hodges has accepted the position of overseer of weaving at the Orangeburg Mfg. Co., Orangeburg, S. C.

C. E. Carter, superintendent of the Arista Mills, Winston-Salem, N. C., has resigned.

A. R. Coleman has accepted the position of overseer of carding at the Sevier Mills, Kings Mountain, N. C.

W. F. Stegall has been appointed superintendent of the Arista Mills, Winston-Salem, N. C.

L. C. Martin has accepted the position of overseer of carding at the Lydia Mill, Clinton, S. C.

J. C. Montjoy has been appointed superintendent of the Ottaray Mill, Union, S. C. He was formerly overseer of weaving at the Union-Buffalo Mill.

E. M. Henley, assistant superintendent of the Erwin Cotton Mills, No. 2, Duke, N. C., has been promoted to the position of superintendent.

Fred Brahler, formerly with the Standard Silk Mills, Phillipsburg, N. J., has been appointed overseer of dyeing for J. H. & C. K. Eagle, Shamokin, Pa.

E. Werner, superintendent of the Poidebard Silk Co., Jersey City, N. J., has resigned to accept the position of superintendent of one of their mills at Paterson, N. J. The position at the Poidebard Silk Co. will be filled by R. Werner, recently superintendent of the Portland Silk Co.

B. E. Connell has been appointed overseer of weaving at the Somerset Woolen Co., Monson, Mass. He was formerly employed at the Faulkner Mfg. Co., North Billerica, Mass.

William E. Davison, designer at the Putnam Woolen Co., Putnam, Conn., has been appointed superintendent. He succeeds Silas Wheelock.

Clovis Bellrose has been appointed overseer of weaving at the Anco Mill, Wilkinsonville, Mass. He was formerly employed at the Brighton Mill, Passaic, N. J.

J. Colby Lewis, Jr., has accepted the position of foreman of combing at the Champlain Silk Mills, Brooklyn, N. Y. He comes from Somersworth, N. H.

Harris E. Drew, overseer of weaving at the Anco Mills, Wilkinsonville, Mass., has been promoted to the position of assistant superintendent to succeed Henry Murphy.

John Mitchell has accepted the position of overseer of spinning at the Shetucket Co., Norwich, Conn. He formerly held this position.

At a meeting of the directors of the Putnam Woolen Co., Putnam, Conn., Silas M. Wheelock was appointed treasurer to succeed the late Eugene A. Wheelock.

Philip Comeau has accepted the position as second hand of weaving at the Shetucket Co., Norwich, Conn.

Herbert H. Marble has succeeded John P. Dodge as treasurer of the Arkwright Mill, Fall River, Mass. Mr. Marble was bookkeeper for the Arkwright Mill for several years.

Daniel Brooks has been promoted to the position of overseer of finishing at the St. Marys Woolen Mfg. Co., St. Marys, O.

Richard Wiley, overseer of spinning for J. Broadbent & Son, Unionville, Conn., has severed his connection with that company.

Francis Hamilton has accepted the position as overseer of spinning at the Richmond Yarn Mills, Richmond, Me. He comes from Taunton, Mass.

Stephen P. Green, overseer of ring spinning for the Ashland Cotton Co., Jewett City, Conn., has resigned and will retire from active life. Robert R. Wilde, overseer of mule spinning, will take charge of the ring spinning in addition to his other duties.

DEATHS

Abel W. Wells, president of Cooper, Wells & Company, hosiery manufacturers, St. Joseph, Mich., died at The Sanitarium, Battle Creek, Mich., Tuesday, October 22nd, 1912. His death came as a shock to his many friends and business associates, for few outside the family knew, that, five days before, he had submitted to an operation. Mr. Wells was born in Canada in 1840 and came to St. Joseph in 1868. He was a mason by trade, but soon engaged in a small way in the manufacture of berry boxes. The new business under his wise management proved successful and his interests gradually extended until they embraced a number of fruit package factories in the north and south. In 1879, because of his success and development of a wonderful business sagacity, he was offered and purchased an interest in the knitting factory recently started by S. T. Cooper & Sons. In 1889, this business was incorporated as Cooper, Wells & Company, with Mr. Wells as president. This office he held continuously until the time of his death, acquiring in 1901 the entire Cooper interest. He was also president of the Union Banking Company of St. Joseph, Mich. and of Wells-Higman Company, St. Joseph and Traverse City, Mich. Mr. Wells was conservative. His judgment almost unerring. He seldom failed to read men at their true value and was an unfailing friend to those who trusted him. His business associates had unbounded confidence in him, consequently his advice was often sought. His various interests are left in the hands of trained men. That of Cooper, Wells & Company will continue under the direct management of his son, J. O. Wells, who for several years has been vice-president and active manager.

Charles A. Stott, a prominent wool manufacturer of the older generation, died at his home in Lowell on October 31st after an illness of several weeks. For many years Major Stott was treasurer and agent of the Belvidere Mfg. Company's Woolen Mills at Lowell, Mass. When this concern gave up manufacturing several years ago, Major Stott retired from active business and has since devoted himself to private affairs and local enterprises in which he was interested. Major Stott was a prominent member of the National Association of Wool Manufacturers and for many years a member of its executive committee. At the time of his voluntary retirement a few years ago, the Association passed resolutions testifying to the great value of his services. He was a staunch protectionist and seldom missed a meeting of the Association, where his genial presence made for him a wide circle of friends by whom he will be greatly missed. He was prominent in Masonic circles, being past Grand Commander of Knights Templar. He was also identified as director with a number of important business enterprises.

P. H. Burton, who was the founder and president of the Merchants Dyeing & Finishing Co., Toronto, Ont., Canada, died on November 17. He retired from active business in 1908, his son having conducted the business under the name of the Canadian Dyers Association, Ltd. Mr. Burton was a well known man among the textile trade in Canada and Europe and ever ready to promote the interests of his company. He was born in Westminster, London, England, in 1839 and came to Canada in 1850.

George Marsden, superintendent of the auto tire cloth weaving for the Bibb Mfg. Co., Macon, Ga., was killed in an automobile accident September 29. He had been in the employ of this company for a number of years and his work was highly appreciated by the company. Mr. Marsden was well thought of among the help. Previously to going South he had been overseer in a number of large mills in the New England States.

Frank Woodhead, manager of the Granite Linen Co., Wortendyke, N. J., was killed at the Midland Park Crossing of the Susquehanna Railroad in Paterson, N. J. Mr. Woodhead was riding in his automobile when the train struck the machine. He died on the way to the Paterson Hospital. Mr. Woodhead was 49 years of age and is survived by a wife and four children.

James W. Taft, for several years secretary and treasurer of the Weybosset Mill, Providence, R. I., died at his home in Providence at the age of 82 years after a brief illness. Mr. Taft was born in Uxbridge, Mass., and retired from the woolen business in 1890. He was president of the Roger Williams Bank of Providence until that institution was absorbed some years ago. A widow survives him.

William Horace Corbin, Esq., vice-president of The Joseph Dixon Crucible Company, Jersey City, N. J., died on November 25th.

Stephen Holman, a well known cotton manufacturer, died suddenly of heart disease at the home of his daughter, Mrs. William E. Plummer, at Swampscott, Mass., at the age of 92 years. At one time he had been connected with the Lyman Mills of Holyoke, Mass., and the Holyoke Machine Co. of Holyoke and Worcester, Mass. Mr. Holman was prominent in the affairs of the National Association of Cotton Manufacturers and was one of the founders of the Home Market Club.

George Stillman Ryer, treasurer of the Ryer Mfg. Co., Paterson, N. J., manufacturers of drapery fabrics and upholstery goods, died at his home in New York City at the age of 42 years.

Joseph Malcolm, owner of the Union Mills, Catskill, N. Y., died at his home recently at the age of 74 years. He was born in Bennington, Vt., and served in the Civil War. He was a member of the 49th Massachusetts Volunteers. A widow and one son survive him.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year. Communications for this department are invited. There is no charge made for printing notices of new mills, enlargements, improvements, etc.

COTTON.

New Mills.

*Alabama, Sylacauga. Work on the new cotton cloth mill to be built here by the Avondale Mills of Birmingham, will be started in a few days. The main building will be 450 ft. long, 150 ft. wide and 4 stories high. The original plan to locate the new plant near the Central Mills, controlled by the same interests, has been abandoned for various reasons and a site about a mile from the business section has been selected. Grey cloths will be the whole output at first. The mill will contain from 30,000 to 40,000 ring spindles and 800 to 1,000 automatic looms.

*Georgia, Fort Valley. L. A. Abercrombie, superintendent of the Fort Valley Cotton Mills, previously reported interested in establishing a 10,000-spindle hosiery-yarn mill for spinning 9s to 13s single yarns on cones, is working on plans and will be ready in a short time to give out details. Mr. Abercrombie may be addressed Box 325, Fort Valley, Ga.

*North Carolina, High Point. The new cotton yarn mill to be built by the High Point Hosiery Mills, Inc., will be known as the Highland Cotton Mills. It will have equipment of 10,000 spindles for spinning hosiery yarns. This project has been previously reported under the name of the High Point Consolidated Mills Co.

*South Carolina, Kershaw. Bids are being received for the erection of the mill building for the new Kershaw Cotton Mill, incorporated several months ago with capital stock of $200,000. The building will be 280 by 130 ft., of brick construction. It has been noted that the equipment will include 10,000 spindles. Leroy Springs, president of the Lancaster Cotton Mills, Lancaster, S. C., is president; John T. Stevens, vice-president, and J. M. Carson, Kershaw, secretary and treasurer.

*Tennessee, Prendergast. The building for the new Prendergast Cotton Mills has been completed and some of the machinery is being installed. The mill has been designed for 10,000 spindles and preparatory equipment for manufacturing cotton yarns. W. J. McLendon, Jr., is president, agent and buyer, and had charge of construction work. W. R. Froneberger is secretary and treasurer.

Enlargements and Improvements.

Alabama, Huntsville. New spinning frames and new cards are being installed in the Abingdon Mills, replacing old equipment.

*Connecticut, Killingly. Construction work is practically completed on the new weave shed at the Attawaugan Mill. Several weeks will be required for the installation of heating equipment, shafting and machinery. This building is to be equipped for weaving fancy cotton goods.

Georgia, Columbus. Enlargements and improvements being made by the Columbus Mfg. Co. will be completed by the first of January. An addition to the equipment of 15,000 spindles and 400 looms is being made. A new building, 1 story high, 60 by 250 ft., to be used as a cloth hall, is nearing completion and the finishing department will be moved to this new space from the main mill.

*Georgia, Columbus. Improvements to be made by the Hamburger Cotton Mills, including the installation of 1,000 spinning spindles and drawing machinery, will be completed at once.

*Georgia, Columbus. Contract for the construction of the addition to the Meritas Mills, previously reported, has been awarded to T. C. Thompson & Bros.

Georgia, Hartwell. There is a strong probability that the Hartwell Mills will be doubled, following the annual meeting in November. Fine sheetings are manufactured on 8,000 spindles and 200 looms and if it is decided to increase, a new mill will be constructed. J. M. Geer, Greenville, S. C., is president and treasurer, and G. G. Slaughter, Greenville, is the purchasing agent.

*Georgia, Trion. The Trion Co., a new concern which has taken over the plant of the Trion Mfg. Co., has engaged J. E. Sirrine of Greenville, S. C., as architect-engineer in charge of the extensive enlargements and improvements which it was recently announced would be made. $300,000 is to be expended in improving the plant.

Maryland, Savage. Jacob Kirn & Sons, contractors, have started work on an addition to the plant of the Savage Mfg. Co. which will largely increase the output. It was reported in July that the carding and spinning departments would be reequipped. Cotton duck is manufactured.

Massachusetts, Adamsdale. The Spencer Yarn Co. is installing machinery in an addition recently constructed. Cotton yarns and ball warps are manufactured.

*Massachusetts, Salem. The new weave shed to be built for the Naumkeag Steam Cotton Co., in the spring, for which the foundation is being put in this fall, will be of brick construction, 421 by 120 ft., 1 story high. They advise that they cannot at this time give the number of looms to be installed.

*Massachusetts, West Warren. Contract has been awarded by the Warren Cotton Mills of the Thorndike Co. to J. W. Bishop Co. of Worcester.

for the erection of a new weave shed to cost $120,000. The building will be 400 ft. long, 80 ft. wide, divided into two sections, one of which will be 178 ft. long, 2 stories high, and the other, 222 ft. long, 3 stories high. It will be located in the rear of the present buildings and will be completed in about eight months. Recently a new cloth room and a new repair shop were erected and the concern is to put a new water system in the mills, contract for which is expected to be awarded shortly. Plans were prepared by Chas. W. Praray. Walter B. Hall is agent in charge of the plant.

Mississippi, Stonewall. The new dye house of the Stonewall Cotton Mills has been completed and is ready for the installation of equipment. In August the complete equipment had not been decided upon.

North Carolina, Concord. Eighteen motors of 20 h. p. each and one of 50 h. p. will be installed in the Franklin Cotton Mills. A 3-story brick mill was built during the summer for this company, manufacturers of coarse cotton yarns. J. W. Cannon is the president.

North Carolina, Draper. Four jacquard looms and 2 spinning frames are being installed in the German-American Mill.

*North Carolina, Franklinton. Construction work has been started on the new 2-story mill, 280 by 104 ft., for the Sterling Cotton Mills and the directors hope the addition will be completed by January 1. Machinery contracts have been placed for about 10,000 spinning and 3,200 twisting spindles. Ball and chain warps, single and two ply, are manufactured. S. C. Vann is president, treasurer and buyer. The plant is operated by electric power and the product sold direct.

South Carolina, Anderson. Directors of the Brogon Mills are considering the matter of adding the manufacture of a line of high class ginghams. If this is done it will be in addition to the line of outing flannels on which the mill has been engaged up to the present time.

*South Carolina, Greenville. Contract for the construction of the 170-foot addition to the Woodside Cotton Mills has been awarded to the Fiske-Carter Construction Co. Reports of this addition and the increase in capital stock have been given previously.

North Carolina, Oxford. A new warehouse and four new tenement houses are being built for the Oxford Cotton Mill Co.

*North Carolina, Rocky Mount. The increase in the steam power plant of the Rocky Mount Mills, manufacturers of 16s to 26s cotton yarns, will consist of a 1500 k. w. turbine and water tube boilers of 1000 h. p. This new equipment, contracts for which have been awarded, will give an increase of 650 h. p., making the company independent of the water supply for power.

North Carolina, Salisbury. It is reported an increase is planned by the Salisbury Cotton Mills. Colored cotton goods are manufactured.

*North Carolina, Shelby. The new mill for the Ella Mfg. Co. is nearly completed and will be ready for new equipment some time in November. Details of this enlargement have been given previously.

North Carolina, Weldon. A steam power plant, including a 100 h. p. boiler and 100 h. p. engine is being installed by the Weldon Cotton Mfg. Co. to supplement the old water power. Hosiery yarns are manufactured.

*Rhode Island, Pawtucket. The addition to the plant of the Dexter Yarn Co. will be completed in about six months. This will permit of an increase in practically all departments, particularly the picking, carding and combing, and provide additional space for speeders and ring spinning frames.

*South Carolina, Anderson. In addition to the extension to the mill, which will be 284 by 106 feet, as noted early in August, a new warehouse extension, 100 by 50 feet, will be built for the Toxaway Mills. New equipment, contracts for which have been awarded, will consist of 10,080 spindles and 240 40-inch automatic looms, installation of the same to be completed by February, 1913.

*South Carolina, Greenwood. Within two weeks the 132-foot extension being built on the main building of the Greenwood Cotton Mills will be completed and inside of a month the installation of new equipment will be begun. This will include 12,500 spindles. Recently the capital stock was increased from $500,000 to $900,000.

*South Carolina, Pickens. New machinery equipment, including 6,000 spindles and 160 looms is being installed in the 85-foot addition recently built on the plant of the Pickens Mill. This enlargement was started in June.

*Texas, Cuero. Ground has been broken for the new warehouse and addition to the mill building of the Guadalupe Valley Cotton Mills. Details have been given previously.

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Mills Starting Up.

Alabama, Munford. The Munford Cotton Mills, which it has been reported would remain closed indefinitely, have resumed manufacturing.

Maryland, Baltimore. Plans are being made for putting in operation the Phoenix and Franklinville mills of the Consolidated Cotton Duck Co. The last of the mills of the Woodberry group to stand idle has been started and additional machinery is being installed.

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Mills Shutting Down.

Massachusetts, Amesbury. The Amesbury plant of the Hamilton Woolen Co. is practically closed, nearly all the orders that will be worked up having been completed. Several months ago the Hamilton Woolen Co. decided to discontinue the Amesbury branch and increase the plant at Globe Village in Southbridge. Developments along this line have been in process for some time.

WOOLEN.

New Mills.

Massachusetts, Boston. The Boston Felt & Rubber Co. has been incorporated with capital stock of $50,000 to manufacture felt boots and shoes. The incorporators are Fred'k J. White, an attorney, with offices at Union Square, Somerville; Charles B. Colley, Shoe & Leather Bldg., Boston, and Henry C. Richardson. Mr. Richardson will be superintendent of the plant and has had many years' experience in this line. The new concern has not decided upon a location, but is in communication with two cities.

Pennsylvania, Philadelphia. W. J. Simpson, a commission weaver operating 10 looms at 2632 N. Mascher St., and a man named LeMart have leased a part of the mill at the N. E. corner of Howard and Montgomery Aves. in which they will install 20 looms and manufacture a line of worsted fabrics for men's and women's wear under the name of the Superior Worsted Mills. Mr. Simpson was at one time designer for the Fern Rock Woolen Mills of this city.

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Enlargements and Improvements.

*Canada, Ontario, Galt. The Galt Robe Co., manufacturers of imitation buffalo robes, astrachan coats and similar goods, whose plant was recently burned with loss of over $100,000, will rebuild at once, and expect to resume business in full about January 1. The insurance was $95,000.

Connecticut, Bozrahville. The Gilman Mfg. Co., manufacturers of shoddy, will rebuild their plant destroyed by fire a few days ago and equip it with new machinery.

Georgia, West Point. Contract has been awarded by the West Point Mfg. Co. for a 2,000 k. w. turbo-generator.

*Maine, Corinna. The addition to the plant of Burrill & Clark recently completed, measures 32 by 135 feet, and affords increased facilities for all departments.

*Maine, Springvale. Ground near the Springvale Spinning Co.'s mill is being broken preparatory to building an addition 75 ft. long, according to report. Recently the capital was increased from $50,000 to $300,000. Worsted yarns are manufactured.

Massachusetts, Millbury. The Mayo Woolen Co. has put some machinery in the old Worcester Knitting Co.'s mill which they purchased last February. They intend to operate this as No. 4 Mill. Electric motors are being installed in this building and also in No. 3 Mill. Power is to be received from the lines of the Worcester Suburban Electric Co.

Massachusetts, North Chelmsford. The Silesia Worsted Mills have awarded contract for a new brick mill to be 3 stories high, 200 by 50 ft., to Miner & O'Neil. Daniel H. Walker will do the brick work. The management has asked that the structure be completed by January 1.

*Massachusetts, West Rutland. The Daniels Worsted Mills are pushing work on the new 3-story mill addition. The mill in Worcester is still in operation, the machinery not having been moved to Rutland. It has been noted in previous reports that the Worcester plant, which in the past has been the main mill, will be discontinued and the real estate sold.

*Minnesota, Fergus Falls. It is reported the Fergus Falls Woolen Mills Co. is giving consideration to plans for a large 5-story mill building. A week ago it was noted that an increase in the capital stock would be made. Woolen woven goods, knit goods and clothing are manufactured.

New Hampshire, West Concord. A new boiler is being installed in the plant of the Crescent Worsted Co., manufacturers of worsted yarns. This is a branch of Lawrence, Mass.

New Jersey, Little Falls. The axminster department of the Beattie Mfg. Co. is being increased and special dyeing facilities are to be provided. The improvement consists of an extension to the main mill and the erection of a new dye house. Tapestry, velvet and axminster carpets and rugs are manufactured on 14 sets, 3 worsted combs and 96 looms. Wm. H. Beattie is the president and superintendent. The New York office is at 8-12 E. 34th St.

*New York, Amsterdam. Nothing can be added at this time to the previous report to the effect that Shuttleworth Bros. Co., manufacturers of carpets and rugs, are planning to build a new mill and more than double their capacity. They are having some plans made, but things have not developed far enough for any details of the new mill or increases in equipment contemplated to be worked out.

New York, Matteawan. The Matteawan Mfg. Co., manufacturers of wool hats on 20 sets, are making an addition to the plant and building a number of new houses for operatives.

*Pennsylvania, Clifton Heights. The new looms, 32 in number, being installed by the Thos. Kent Mfg. Co., are to replace old machines, and are not an increase in the company's equipment.

Rhode Island, Thornton. Six spinning frames have been installed in the old British Hosiery Co. by the Priscilla Worsted Mills of Providence. These will be operated on worsted yarns and will be a branch of the plant at Providence.

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Mills Starting Up.

*Maine, Bridgton. The old plant of the Forest Mills Co., recently purchased by the American Woolen Co., will be started up, giving employment to about 200 hands. There are 8 sets of cards and 40 looms. It has been noted that Thomas Sampson will be the superintendent.

Maryland, Reisterstown. The Oakland Mills will resume manufacturing at once under the management of Herbert Hooper, the president and treasurer of the old Oakland Mfg. Co., which recently decided to liquidate. This is an 8-set mill with 40 looms, manufacturing woolen suitings.

*Washington, Kirkland. About November 1 the old plant of the Seattle Woolen Mill Co. will be started up by the new Matzen Woolen Mills, whose incorporation with authorized capital of $100,000 we reported under Seattle, in September. Lines of mackinaws, blankets and woolen suitings sets of cards and 15 looms. The mill has been shut down for some time and it is now being put in readiness to begin operations. George Matzen is president, treasurer and buyer of the new company and J. F. Braillier is superintendent.

KNIT.

New Mills.

*Canada, New Brunswick, Moncton. A factory building has been secured by the Humphrey Unshrinkable Underwear Co., Ltd., reported incorporated last week, and 5 sets of 48-inch cards will be installed at once. Natural gas is to be used for power. Within a year they expect materially to enlarge the plant. The board of directors is as follows: Frederick W. Sumner, William F. Humphrey, William F. Ferguson, of Moncton; Albert E. Trites, of Salisbury, O. T. Daniels, Fred Smythe and J. L. McDonald, of Halifax. The officers elected are F. W. Sumner, president; O. T. Daniels, vice-president; Fred C. Smythe, secretary, and John L. McDonald, general manager. W. F. Humphrey is president and general manager of J .A. Humphrey & Son, Ltd., woolen manufacturers of Moncton.

Illinois, Chicago. A knitting plant has been established at 2451 W. North Ave. by Louis Marx under the style of the Phoenix Knitting Works with 16 Lamb machines run by electric power. Worsted "home made" hosiery is the product and 2/18s, 3/18s and 4/14s yarns are used. The product is sold direct to jobbers and retailers.

*New York, Oswego. In September it was reported that the Wm. H. Spanswick Mfg. Co. of Fulton had purchased the mill building at Oswego erected about two years ago by James A. Shufelt, who planned to organize a company and engage in the manufacture of union suits. Machinery has been ordered for this plant which will give an output of 700 dozens daily of children's ribbed underwear and some of this equipment will arrive shortly. By the first of the year the mill will be fully equipped and operating to capacity. Mr. Shufelt has been elected vice-president of the Wm. H. Spanswick Mfg. Co. and will be in charge of the plant here. The original plant of the Spanswick Co. is at Fulton and has been in operation for about five years. A new plant is about to be started in Parish, where it has been reported a building was recently purchased. The mill here is 60 by 60 ft., 3 stories high, with a 1-story engine room and dye house, 20 by 72 ft.

*Pennsylvania, Chambersburg. A building on King St. has been secured by the Blue Ridge Knitting Co. of Hagerstown, Md., and will be equipped as a branch mill. The installation of machinery will begin at once and operations started before the end of the month. The Industrial committee of the Chamber of Commerce secured 100 girls to work in the factory.

*Pennsylvania, Quakertown. Good progress is being made on the plant of the new Quakertown Knitting Mills Co. which will be 43 by 150 ft., 2 stories high and basement. Machinery will be installed during December, including 100 knitting machines, 20 loopers, 4 welters and 25 ribbers for making ladies' cotton, mercerized and silk hosiery. Electric power equipment and dye house equipment will be installed. The officers are E. O. Correll, president, and O. Paul Kaffke, formerly manager of the Easton Knitting Mills Co., Easton, Pa., treasurer and buyer.

Pennsylvania, Philadelphia. The Colby Hosiery Co., Chas. Colby, proprietor, has leased the building at the corner of 2nd and Diamond Sts., where cotton and silk hosiery will be manufactured. The company is buying goods from other manufacturers until the equipment is installed.

Pennsylvania, Philadelphia. L. Friedman & Co., L. Friedman, superintendent, have leased a portion of the building at 241 Market St. and are installing 12 flat knitters, 6 round frames and 8 sewing machines, which they will operate on Shaker sweaters and sweater coats for men, women and children. The plant will be operated by electricity and the production sold direct.

Pennsylvania, Philadelphia. The Oliver Knitting Co., James and Thos. A. Oliver, proprietors, are operating 3 flat knitters, 14 round frames, 9 sewing machines and 3 loopers on athletic hose, sweaters and jerseys, which they sell direct. The plant is located at 2720 N. 5th St.

*Pennsylvania, Philadelphia. A charter has been granted the Acme Knitting Co., with a capital of $5,000. This concern, as recently reported by us, will install machinery for the manufacture of knitted neckties at East Thompson and Neff Sts.

Pennsylvania, Pottsville. Mr. O'Connor of the old firm of Petry & O'Connor, proprietors of the Glen Knitting Mills, is building a new mill which he will equip for manufacturing women's ribbed underwear. A Mr. Miller has taken over his interests in the Glen Knitting Mills, as noted in another part of this issue.

*Pennsylvania, Seven Valley. The present equipment of the Seven Valley Hosiery Mills, reported in last issue as having begun the production of men's half hose, consists of 20 knitting machines, 5 ribbers and 4 loopers, operated by steam power. Nathan and H. I. Gladfelter are the men interested, and the buying is done by both, the product being sold through commission brokers. This place is 11 miles south of York, on the line of the Northern Central R. R.

*Wisconsin, Racine. The Racine Hosiery Co. has equipped a plant at 7th and Wisconsin Sts. with 12 knitting machines, 1 ribber, 2 loopers and 2 sewing machines and is making 220-240 needle hosiery and half hose, using lisle, mercerized and silk yarns. Electric power is used and the product is dyed and finished and sold direct. The concern was chartered in September with capital stock of $25,000 and organized with W. R. Anderson, president; A. R. Anderson, treasurer and buyer, and J. H. Brinsley, secretary and superintendent.

Enlargements and Improvements.

Connecticut, Hartford. The Hartford Knitting Co. has purchased some of the machinery formerly operated by A. H. & C. B. Alling Co.

*Georgia, Rome. Enlargements proposed for the Cherokee Hosiery Mill are under consideration and if carried out will increase the capacity about 40 per cent. It has been noted that this plant has been taken over by interests connected with the Rome Hosiery Mill who organized a new company under the style of the Cherokee Hosiery Mills Co. with capital stock of $60,000.

Indiana, Fort Wayne. The reported increase in the capital stock of Thieme Bros. Co. will be from $150,000 to $200,000, not $500,000 as reported previously. A 3-story addition will be built and it is planned to double the output. Men's and women's full fashioned silk hosiery is manufactured. Contract for the addition has been awarded to Albert Wermuth of Fort Wayne.

*Louisiana, New Orleans. Immediate changes to be made by the Alden Mills include a rearrangement of the picking and carding departments. They also plan to install machinery for reclaiming their knitting and cotton waste.

Maryland, Thurmont. The branch plant operated here by the Union Mfg. Co. of Frederick is to be enlarged by an addition of frame construction in the rear of the present building, which will be used chiefly to store goods and to provide facilities for a heating plant.

Massachusetts, Lowell. A 1000 h. p. steam turbine is being installed in the plant of the Shaw Stocking Co. The old power equipment consists of two reciprocating engines, and some electric power has been purchased from the Lowell Electric Light Corp. for the yarn mill. When the new installation is completed practically all the machinery will be driven by motors.

*Massachusetts, Springfield. Plans have been completed and contract awarded for a mill to be built on the land recently purchased by C. B. Potter of the Potter Knitting Co. The new factory is to be of the most modern type of brick and steel construction and will cost about $115,000. It will be leased on its completion to the Potter Knitting Co. for fifteen years and that concern will lease some of the space to the Hampden Knitting Co. of which C. B. Potter is treasurer. The building will be 184 ft. long, 62 ft. wide, 6 stories high.

Michigan, Pontiac. A 2-story brick mill will be built for the Pontiac Knitting Co. on the east side of Saginaw St. In June the company suffered a loss of about $15,000 due to a fire in the carding and spinning department. Repairs have been made and the plant is in full operation again. Knit fulled goods, including jackets, shirts, lumbermen's socks, mittens and gloves are manufactured. F. G. Jacobs is manager.

Minnesota, Duluth. The purchase of the Mankato Mills Co. of Mankato, by F. A. Patrick & Co. will not affect their plans to build a large factory building in Duluth, partly for use in the manufacture of clothing and partly for the manufacture of knit goods. The hosiery department of the Mankato Mills Co. will be moved to the new mill. The carding and spinning departments and the sweater knitting machines at Mankato will be continued in operation at that place. Work is to be started at once on the construction of the new mill. It will be in two sections, each 60 by 140 ft., 3 stories high. One of these sections will be used for the manufacture of clothing and the other for a knitting mill. These changes will not affect The Patrick-Duluth Woolen Mill, the woolen woven goods plant owned by F. A. Patrick & Co.

*Minnesota, Minneapolis. A $10,000 addition is to be built to the Minneapolis Knitting Works' building, and construction contract has been awarded to J. & W. A. Elliott. It will be 3 stories high, of brick construction. The capital was increased in September to $150,000 and it was reported at that time that an enlargement would be built to double the size of the plant. Walter H. Thorp is president and C. E. Ovenshire, treasurer, superintendent and buyer. Children's underwaists and infants' knit bands and shirts are manufactured.

*New York, Averill Park. One of the old mill buildings of the Faith Knitting Co. is being torn down to make way for a new mill.

New York, Broadalbin. The Broadalbin Knitting Co., Ltd., is installing a new boiler and a pair of new water wheels, also building two new dams in connection with the water power. These improvements are being made with the idea of building an addition to the plant in the next year to accommodate several new sets of cards and jacks. Cotton, woolen and merino underwear, jersey cloth and fleece linings are manufactured on 6 sets of wool cards, 60 knitting and 80 sewing machines. Henry C. Finch is president and treasurer, and B. C. Smith, secretary, superintendent and buyer.

New York, Brooklyn. Alterations are being made by Henry Gernshym & Bro. at a cost of about $15,000 and include the installation of a 120 h. p. boiler. The concern is very busy.

*New York, Buffalo. The new 4-story mill being built for the Monarch Knitting Co. will be completed about the end of the year and they expect to move the machinery from the old building about January 15. It has been noted that further enlargements are being considered, including the building of a mill for spinning and a dye house, and it is probable that these plans will be carried out when the new mill now under construction is completed and equipped. Sweaters and fancy knit goods are manufactured. This is a branch of the Monarch Knitting Co. of Dunnville, Ontario. Harris L. Mitchell of Buffalo is the superintendent and buyer.

New York, Kingston. According to report, Wm. Nugent, who took over the Ashokan Knitting Mill several months ago and started it up on children's union suits, has leased another building in which he will install knitting, dyeing

and bleaching machinery for manufacturing children's cashmere hosiery.

*New York, St. Johnsville. Ground has been broken for the addition to the Royal Gem Dept. of the Union Mills. Women's and children's cotton ribbed underwear is manufactured at this plant

*New York, Utica. Stockholders of the Imperial Textile Co. will vote on a proposition to increase the capital stock from $25,000 to $40,000 on October 26. It was noted last month that property in Washington Mills, six miles from Utica, had been purchased and a mill would be erected on the completion of which the business would be moved from Utica to that place.

North Carolina, Burlington. Thirty-three new knitters, 8 loopers and 7 ribbers have been purchased by the Sellers' Hosiery Mills, increasing their output to 500 dozens of men's and women's seamless hosiery a day.

North Carolina, High Point. The addition to the Durham Hosiery Mills, which will be a 2-story mill, 90 by 100 ft., costing $15,000, is nearing completion. A number of new knitting machines will be installed in addition to the equipment which they now have.

*North Carolina, Weldon. Further improvements planned by the Weldon Cotton Mfg. Co. include the installation of sewing machines and knitting machines to make a cheap line of men's and boys' union suits. This has been one of the most successful mills in the South making cheap line of men's, boys' and children's two-piece underwear.

North Dakota, Fargo. Some new equipment has been ordered by the Red River Knitting Mills, M. E. Linke, proprietor. This is a new plant established a few weeks ago at 206 Front St., manufacturing sweater coats, hosiery, etc.

*Ohio, Toledo. Work was started on the new mill to be occupied in part by the Dolphin Hosiery Co. early this month and they will be installed in their new quarters by January 1. The capital has been increased to $50,000, as noted, and there will be some changes in the equipment. Fred G. Gould is president; Jno. A. Vonficht, treasurer and buyer, and Geo. Voirol, superintendent.

Pennsylvania, Middletown. Work has been completed on the addition to the local plant of the H. A. Romberger Mfg. Co. and new machinery equipment, including 150 knitting machines is being installed. The new machinery will be electrically driven and will be in operation in two to three weeks.

Pennsylvania, Philadelphia. The Harrison Looping Mills, 5815 Jackson St., Wissinoming, have increased their plant to 38 loopers and 10 welters. They do looping and welting for the trade.

Pennsylvania, Philadelphia. At an expenditure of $35,000, the Brown Knitting Co., one of the largest manufacturers of full fashioned hosiery in this city, will make extensive improvements to its buildings at Hancock and Westmoreland Sts., which will consist of a six-story addition, 50 by 250 ft., and 49 by 100 ft., also other alterations and installation of new fire escapes. The contract has been taken up by a local builder who will commence the operation at once.

Pennsylvania, Philadelphia. Arrangements are being made for the erection of a two-story brick addition to the Park Hosiery Mills on Orianna St., above Bristol. The dimensions of the addition will be 32.2 by 30.2 feet and will cost $1,600. They are manufacturers ladies' and half hose and have been for some time cramped for room, the enlargement to the plant being necessary to enlarge their equipment and increase their output.

Pennsylvania, Philadelphia. Fire recently damaged the large building occupied by Thomas E. Brown & Son, manufacturers of full fashioned hosiery at 2nd and Westmoreland. The damaged portion of the plant will be repaired at once.

*Pennsylvania, Reading. The Deeds & Staudt Hosiery Co. has been formed to operate the local plant of H. K. Deeds, the machinery of which was recently removed here from Lebanon, as noted. Additional equipment is to be installed here, and Mr. Deeds will also reopen the mill at Lebanon, 21 new knitting machines having already been purchased for that purpose. Men's and women's seamless cotton, lisle, mercerized and silk hosiery are manufactured.

*Pennsylvania, Robesonia. The brick addition, 35 by 40 ft., which is under construction for the Robesonia Knitting Mills, will complete the rebuilding of the mill which was destroyed by fire and it will be used for knitting purposes. The finishing department of the old plant was rebuilt about a year ago and is of cement block construction, 35 by 40 ft. D. K. High is president and treasurer, and E. V. R. High is superintendent and buyer. Men's half hose is the product.

Pennsylvania, Sellersville. Report has it that John Blood and Bro., manufacturers of underwear at Trenton Ave. and Allegheny Ave., Philadelphia, are about to purchase the building at Sellersville, at one time occupied by the Armure Tapestry Mills. If the purchase is made it is said they will install machinery to be operated as a branch of the mill in this city.

Tennessee, South Pittsburg. An enlargement is being built at the Aycock Hosiery Mills and the equipment will be increased to 100 footers, 230 ribbers and 30 loopers. Women's and infants' and children's cotton hosiery is manufactured on present equipment of 50 latch needle knitting machines and 140 ribbers. R. C. Aycock is manager and buyer.

Wisconsin, Merrill. At a recent meeting of the directors of the Merrill Knitting Co. the building of another story on the company's mill was discussed and it is likely that this will be done very shortly. Two new knitting machines and a new sewing machine were ordered recently and are

expected in a few days. There was also some discussion at the recent meeting of a plan to build a brick mill in the spring. This is a small company with capital stock of $15,000 which took over the plant of the Forest City Knitting Co., Cleveland, O., some time ago. Sweaters and fancy knit goods are the products. C. Hendrich is the manager.

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Mills Starting Up.

*Massachusetts, Wakefield. Manufacturing has been started by the new Middlesex Knitting Co., incorporated in August with capital stock of $10,000 to manufacture underwear, sweater coats, etc. Three rooms on the second floor of the Taylor Bldg. have been equipped with knitting machines and sewing machines. A. H. Fairbanks is treasurer and buyer, and W. Hendrickson, superintendent.

*New York, Bath. Within a week the old Bath Knitting Mills will be started up by the Canasawacta Knitting Co. of Sherburne, which has taken over the property.

New York, Walton. The Southard Knitting Co., Inc., has been granted a charter with capital stock of $50,000 to manufacture and sell knit goods. The incorporators are Geo. H. May, John Palmer and Emil C. Eger. This company has been organized to take over and operate the plant of the White Rock Knitting Mills Co. which has been operated recently under the direction of Col. Ellsworth Southard, receiver for the company. Local capital is largely represented in the new company and Col. Southard will be retained as president and general manager. The new company will specialize on underwear and will begin operations as soon as possible, according to report.

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Mills Shutting Down.

*Maryland, Boonsboro. The Branch mill established here a few weeks ago by the Blue Ridge Knitting Co. of Hagerstown, has been discontinued as a sufficient number of girls could not be secured to work in the mill.

Pennsylvania, Philadelphia. The National Hosiery Co., Sepviva and Hazzard Sts., of which Gustav Rumpf, Jr. was the head, has shut down its plant and will not start it up again. The equipment is being offered for sale. The mill contains 200 knitters, 9 full fashioned frames, 25 sewing and 28 loopers, which they operated on seamless, full fashioned and ribbed hosiery.

SILK.

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New Mills.

*New York, Lackawanna. Ground has been broken and construction contract let for the silk mill to be built by the Janes Silk Mills Co. of Paterson. It has been noted previously that a part of the equipment of the Janes Silk Mills Co. will be moved here from Paterson, on completion of the building.

*Pennsylvania, Green Lane. The contractor building the new mill for the Hill Silk Mfg. Co., Paterson, is pushing the buiding rapidly to completion. It has been noted that only part of the dress silk equipment of the Paterson plant will be brought here at first.

*Pennsylvania, Herndon. The foundation for the new silk throwing plant of F. Q. Hartman, Inc., of Danville, Pa., is completed and materials for the building proper are arriving.

*Pennsylvania, Nazareth. Messrs. Jacoby & Weishampel of Allentown have prepared plans and specifications for the new silk mill to be built here by McCollom & Post of Paterson. Flick & Simons, contractors, of Nazareth have been awarded the construction contract at $17,980. Work is to be started on the mill at once and they expect manufacturing will begin about March 1, 1913. The new mill will be 2 stories high, of brick construction, 150 by 52 ft., and will start with 50 looms on dress silks.

MISCELLANEOUS.

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*Connecticut, East Hampton. Contract for the erection of a new 2-story building for the Summit Thread Co., manufacturers of spool cotton, has been awarded to Lewis A. Miller.

*Georgia, Atlanta. The American Tape Co., organized to take over the business of the Ti-tite Tape Co., as noted previously, uses 28 to 32s white and colored yarns on tubes and makes tape by sizing and gluing. They have begun operations.

Indiana, Michigan City. The State Prison Board of Trustees has decided to erect a new building for the binder twine industry. The structure will increase the capacity of the prison plant by 100 per cent. and will cost $25,000. Work is to be started immediately. Warden Fogarty is in charge.

Kansas, Topeka. McEntire Bros., manufacturers of mattresses, who have been operating one garnett for the manufacture of mattress felt, have purchased a second machine which will be installed as soon as possible. It is practically decided that during the next season they will put in a third garnett and make commercial cotton bats.

*Kentucky, Newport. The plant of the Empire Wadding Co. of Cincinnati, formed to manufacture commercial wadding, of which Horace W. Harmeyer is secretary and general manager, will be located at this place, across the river from Cincinnati. A building on the site which has been secured will be torn down just as soon as an unexpired lease is cancelled and the work will be rushed to completion. The office is Suite 208, 519 Main St., Cincinnati.

Maryland, Baltimore. A concrete factory building is to be erected on Guilford Ave. near Eager St. for the International Bedding Co., 337 North St. Plans are now in preparation. The concern manufactures mattress stock on present equipment of 2 cards, 2 garnetts, 3 pickers and 12 sewing machines. When the new building is completed the present plant will be discontinued and the equip-

ment will be largely increased in the new quarters. F. L. Goff is president and H. M. Taylor, treasurer and buyer.

Massachusetts, Assonet. It is expected a new treasurer will be elected shortly by the Puritan Mills and the plant started up. Products from cotton waste are manufactured.

Massachusetts, Fall River. A quantity of new machinery has been installed by the Crystal Spring Dyeing & Bleaching Co. at Assonet, carrying out in part the plan to handle a better grade of goods and increase the output. The recent reorganization of this company has been noted and John Thwaites is in charge. The bleaching business is being extended to embrace all lines of white finishes, both in soft and filled goods

*Massachusetts, Ludlow. Stockholders of the Ludlow Mfg. Associates voted to issue $1,000,000 new stock at a special meeting held for this purpose October 9. This will make the capital stock $5,000,000. The new stock is to be paid in two equal installments, March 15 and September 15. 1913, and the proceeds will be used in extending the plant and for other purposes along the lines of increasing the business, as noted previously. The office is at 111 Devonshire St., Boston.

Massachusetts, Webster. A concrete raceway is being built at the Stevens Linen Works.

Missouri, St. Louis. It is reported the experimental plant being established in St. Louis by the Lowell Bleachery of Lowell. Mass., will be ready for operations in a few weeks. Some of the machinery is now in transit from Lowell, and a number of operatives in the Lowell plant are coming here to work. A building on Laclede Ave. has been rented, as noted previously, and will be equipped with 1 set of drying cans, 1 tenter frame, 3 mangles, kiers, washing machines, nappers, etc., which will give a fair test as to whether their Lowell finishers can be duplicated in St. Louis.

New Hampshire, Suncook. A new concern has just started business here making edgings and webbings under the style of the Suncook Artistic Webbing Co. Men interested are the Messrs. Emil and Robert Zinn, formerly connected with the Barmen Webbing Co. at Gossville, N. H. It is understood the plant at Gossville will be discontinued.

New Jersey, Beverly. The Wall Rope Co., manufacturers of cordage and twines, have arranged with John G. Brown, specialist in designing and building manufacturing buildings, located in Philadelphia, for the erection of two new buildings. from plans prepared by him, the work to be started at once. The buildings will be of slow burning construction with special attention to light space and will measure 75 by 122, and 30 by 75 ft., respectively.

*New Jersey, Paterson. The Imhoff-Berg Silk Dyeing Co., incorporated several months ago with capital stock of $25,000, located on Chadwick St., where a business of dyeing fast blacks on skein silks for the silk lining and knitting trades is carried on. The capacity is 1,200 pounds daily. Dr. M. Imhoff is president and manager, and O. Berg, treasurer.

New Jersey, Paterson. A new concern was recently incorporated under the style of the Progressive Silk Finishing Co. to do a business of finishing of broad silk goods. The capital stock is $25,000. Gustave Wagniere has been elected president, and Louis A. Rey, treasurer. They plan to begin operations in December.

*New Jersey, Paterson. The Walser Mfg. Co. have removed their machinery to the new mill which has been in course of erection for several months. No increase in equipment will be made at this time.

*New Jersey, Plainfield. Some of the machinery equipment of the new Rollo Haircloth Co. has been installed, but it is understood additional machinery will be ordered. This company was incorporated in August with capital stock of $50,000 to manufacture hair cloth and organized with Wm. Blucher, president, superintendent and buyer, and W. Hamberger, secretary and treasurer. Rudolph Recher of Recher & Co., commission combers of worsted, is interested.

*New York, Glens Falls. At a special meeting of stockholders of the Standard Textile Co., manufacturers of cotton bats and comfortables, it was voted to increase the capital stock from $60,000 to $100,000 as recommended by the directors. The plant is to be increased, as noted several weeks ago.

*New York, New York City. Operations will be started about November 1 by the Modern Silk Finishing Co., Inc., recently chartered with capital stock of $50,000 to do a business of silk finishing. The plant is to be located at 210 11th Ave., corner of 25th St. Wm. Messmer has been elected president; A. W. Buhlmann, the textile engineer with offices at 200 5th Ave., treasurer and buyer.

*Pennsylvania, Philadelphia. The Buffalo Dye Works, reported by us as about to start up on B St., below Thayer, will be managed by A. Musgrave, formerly connected with the Cohoes Dyeing Co., of Cohoes, N. Y. The plant will be equipped with machinery for dyeing woolen, worsted and cotton yarns, raw stock, and hosiery, with a capacity of from 15,000 to 20,000 pounds per day. 100 winding spindles also have been installed. It is expected that the plant will be in operation within the next three or four weeks.

Pennsylvania, Philadelphia. The two-story building on Willard St., above Frankford Ave., formerly occupied by the late Fern Rock Bleachery, has been taken over and is being equipped by the Progressive Dye & Finishing Works, with John Kaye as treasurer and F. H. Birkly, as superintendent. The plant will be operated on the finishing and dyeing of woolen, worsted and cotton men's wear and dress goods.

Pennsylvania, Philadelphia. Messrs. Splane & Armstrong, 2111 E. Westmoreland St., printers of labels, tickets, box tops, etc., are replacing their old style machines with new and up to date multicolor machines, which will insure not only better results but an enlarged production.

New Publications

(Any work noticed under this head can be obtained through the office of this journal.)

Cotton Carding; by J. J. O'Grady; 103 pages, 4 by 6; published by the author at Woonsocket, R. I. Price $1.25.

The author, who is overseer of carding at the Mannville Company, has written this book in order to give cotton carders information in convenient form regarding their trade. He begins with a general account of the processes of picking and carding. Next comes a chapter on the calculation for machines, the subject then being treated under the following heads: Cotton Carding, Doffer Speed Constant, The Sliver Lap Machine, Combing, Finisher Drawing, Drawing Frames, Speed Frames, Twist in Roving, Roll Setting on Speed Frames, Constant Numbers, Square Root, Weight of Lap and Drafts, Advantages of Textile School, Qualifications for a Good Overseer, Instructions for Grinders, Strippers and Speeder Tenders.

Treatment of Effluents from Dyehouses and Textile Factories; by J. H. Garner, B. Sc.; 26 pages, 7 1/2 by 11; The Society of Dyers and Colorists, Market St., Bradford, Eng. Price $1.

This is a reprint from the Journal of the Society of Dyers and Colorists, of an essay for which the silver medal was awarded to the author. It deals with a subject of great importance and American manufacturers will welcome this systematic study of the question. The author first takes up the treatment of waste liquors from textile mills and dyehouses. This is followed by the consideration of the subject under the following heads: Purification of Wool-Washing Refuse, Filtration, The Acid Method of Grease Recovery, Precipitation, Evaporation Processes, Solvent Scouring, Purification of Refuse from Yarn and Piece Scouring, Purification of Liquid Refuse, Quiescent Settling Tanks, Continuous Flow Tanks, Filtration, Sludge Disposal, Purification Plants for Use on Limited Sites, Waite's Plant, Bell's Filter, Mackey-Akeroyd Plant, Watson's plant.

Household Textiles; by Charlotte M. Gibbs, A. M.; 233 pages, 5 by 7 1/2; Whitcomb & Barrows, Boston. Price $1.25.

This book has been written for the consumer, and the author has done her work so well that the non-technical reader will find the little volume very useful in acquiring the knowledge that everyone should possess regarding textile goods. There are passages which show a lack of accurate information on the part of the author and surprising carelessness of those who read the book before publication, such, for example, as the following definition: "Flocks. The last and poorest class of shoddy consists of very short clippings from tailor establishments or mills, called flocks. These are too short to weave alone, but may be felted into the surface of woolen cloth to add weight." Future editions, which the book certainly deserves, will afford an opportunity of correcting such defects. The table of contents is as follows: Spinning and Weaving, Classification of Fibers, Cotton, Wool, Silk, Linen, Bleaching and Dyeing, Adulterations and Buying, Hygiene of Clothing Materials, Design and Color in Textile Fabrics, Labor Conditions and Efforts to Improve Them, The Arts and Crafts Movement.

Man or Machine—Which? by Al Priddy; 111 pages, 4 1/2 by 8; The Pilgrim Press, Boston, Mass. Price 75 cents.

In this book the author has told his story of American factory life and the struggle for character. The conditions under which men and women work on without protest, the development of machinery and of efficiency and economy in business as related to humanity and the conditions at the present time in great industries are all told in a vivid and interesting manner.

The Dyeing of Cotton (La Teinture du Coton), by E. Serre, professor at the School of Commerce and Industry at Rouan, France; 281 pages, 5 by 7 1/2; H. Dunod and E. Pinat, 47 Quai des Grands-Augustins, Paris, France. Price $2.

The introduction to this work consists of an interesting sketch of the development of the dyeing industry at Rouan during the past century. This is followed by general recommendations regarding laboratory work. The subject of the work, "The Dyeing of Cotton," is treated under the following heads: Water and the Products Used in Dyeing, Cotton, The Dyeing of Cotton in Skeins, Vegetable Colors, Substantive Colors, Medial Colors, Basic Dyes, Colors Developed on the Fiber, Alizarine Dyes, Vat Dyes, Indanthrene Colors, the Dyeing of Cotton Piece Goods, Printing Cotton Goods, Finishing Cotton Fabrics, Artificial Colors. The text is in French.

Ribbon Weaving (Die Bandweberei); by Otto Both; 279 pages, 5 1/2 by 8 1/2; Dr. Max Jaenecke, Leipzig, Germany. Price $2.

The first edition of this work appeared in 1907 and is now followed by the second edition enlarged, revised and rearranged to accommodate much new material. The book begins with a chapter on the preparation of yarn for weaving into ribbon and is followed by a description of the various types of ribbon looms. Next comes a chapter on the process of ribbon weaving. The author goes into the subject of ribbon calculation in great detail, incidentally illustrating the chaos of weights and measures resulting from the use of metric, old German, old French, English and metric units.

BUSINESS LITERATURE

The Murphy Automatic Feed; The Murphy Iron Works, Detroit, Mich.

This very attractive catalogue contains an illustrated description of the Murphy automatic

smokeless furnace which is in use in a large number of plants throughout the country. It first gives an account of the mechanical construction and operation of the furnace itself. This is followed by numerous and excellent illustrations of boiler plants in various power plants in this country and Canada.

The Trail of a Pioneer; The American Engineering Co., Philadelphia, Pa.

This publication takes the reader from Boston to Milwaukee, giving views of power plants equipped with Taylor stokers. The plants are located at Boston, Cambridge, Lowell, Worcester, Providence, Springfield, Hartford, Brooklyn, New York City, Atlantic City, Philadelphia, Cleveland, Detroit and Milwaukee. The illustrations and details regarding the plants provide a very convincing demonstration of the vast amount of power generated by the aid of the Taylor stokers. The catalogue itself is a very artistic production and is designed and printed in a style that heretofore has been more frequently applied to products other than those strictly mechanical. The edition is necessarily limited on account of its high cost and is for distribution to engineers and others particularly interested in the subject.

The Terry Turbines; The Terry Steam Turbine Co., Hartford, Conn.

A 12-page booklet describing and illustrating the Terry turbines. This turbine has been widely adopted by practically all the prominent central stations for driving auxiliaries, such as boiler feed pumps, condensers, hot well pumps, etc. The last two pages contain a partial list of the public service electric corporations using Terry turbines.

Sturtevant Gasolene Electric Generating Sets, Catalogue No. 205; The B. F. Sturtevant Co., Hyde Park, Mass.

This catalogue gives an illustrated description of the various types of gasolene electric generating sets built by the Sturtevant Co. The construction of the generators is clearly shown and much valuable information given regarding their care and operation.

The Otto Cycle; The Otto Gas Engine Works, Philadelphia, Pa.

A 16-page booklet describing and illustrating the Otto horizontal crude oil engine operating on the Diesel principle and known as Type DH 50. It also contains a table of the comparative cost of fuel.

The Selection of a Boiler Feed Water, by J. C. Wm. Greth; William B. Scaife & Sons Co., Pittsburgh, Pa.

This is a reprint of a paper read by Mr. Greth before the Engineers' Society of Western Pennsylvania. It contains much useful information regarding feed water and should be in the hands of all users of steam boilers.

Industrial Notes

NEW QUARTERS

The Dennison Manufacturing Co., makers of shipping and marking tags, together with a multiple variety of other useful business commodities, have rented the large store and basement, corner of Fifth Ave. and Twenty-Sixth St., New York, and will remove their up-town store now on Twenty-Seventh St. to that location. The store is extremely attractive, having a large window and entrance on Fifth Ave. and five large windows and entrance on Twenty-Sixth St., making it very light. A mezzanine balcony will accommodate the office force, while the very large basement will furnish ample stock room. The company's down town establishment will continue to occupy its building at 15 John St.

THE SILK ASSOCIATION IN NEW QUARTERS

After occupying offices in the Silk Exchange building for seventeen years the Silk Association of America has found it necessary to remove its headquarters to the twenty-story Hess Bldg., corner of 4th Ave. and 26th St., New York. The present officers of the association are: Jerome C. Reed, president; Charles Cheney, first vice-president; H. Schniewind, Jr., second vice-president; Louis Stearns, third vice-president; Ramsay Peugnet, treasurer and secretary.

CUTTING MACHINES

One of the latest Oswego Auto Rapid-production cutting machines with the power saving device and double knife shear and several other new improvements will be shown at the exhibit of the national printing publishing advertising and allied trades exposition to be held at the Grand Central Palace, New York, on April 19th to 26th, 1913. It will pay to attend this exposition, and especially the Oswego exhibit in booth 97, just to the left of the entrance stairs.

THE JOSEPH DIXON CRUCIBLE CO.

At the regular monthly meeting of the board of directors of the Joseph Dixon Crucible Co. held Monday, Oct. 21st, the following changes in the officers and board of directors were made on account of the death of the vice-president, William H. Corbin. George E. Long, former treasurer, was elected vice-president to succeed Mr. Corbin; J. H. Schermerhorn, former assistant secretary and assistant treasurer was elected to membership in the board of directors and treasurer of the company. Albert Norris was elected to the office of assistant secretary and assistant treasurer.

Pennsylvania, Easton. Roehlen-Pittenger Silk Co. have under consideration plans for increasing their equipment. Broad silks are manufactured on 24 looms.

REDUCED RATES IN MASSACHUSETTS SAVINGS BANK LIFE INSURANCE

The State actuary of savings bank life insurance announces a reduction in the rates of the straight life and 20-payment life policies for $500 to take effect November 1st, 1912. This reduction was made only after consultation with leading New York actuaries and it was unanimously agreed that the reduction could and should be made.

The new rates for the straight life and 20-payment life policies take effect November 1st, 1912, the beginning of the fiscal year of the savings insurance banks, and the change is to be retroactive. All premiums after November 1st, not only on new policies but also on policies already issued, will be on the basis of the reduced rates.

The amount of the reduction varies at different ages, but on a straight life policy for $500 at age 50 the reduction amounts to $1.88; on the 20-payment life policy for $500 at the same age the reduction amounts to 96 cents.

The premiums on the 20-year endowment policies issued by the savings banks are already much lower than those of other companies and this reduction on the straight life and 20-payment life policies also makes these policies considerably lower.

The Erstling Brothers Knitting Mills, Incorporated, have moved their New York office from 51 Leonard St. to 460 Fourth Ave., corner 31st St.

NEW OFFICES OF THE GROSSER KNITTING MACHINE COMPANY

The accompanying illustrations show several views of the new offices of the Grosser Knitting Machine Company, Max Nydegger, at 260 West Broadway, New York. These are in the same building which this company has occupied ever since it opened offices with Mr. Nydegger on Oct. 25, 1904, when one small room only was occupied. A year later larger stock rooms and machine shop were rented to accommodate the business in a better way. Each year more business has required additional help until now there are always ten and sometimes more people employed in the office; while four to six mechanics are required to take care of the machine work, setting up machinery and doing general repair work.

GROSSER KNITTING MACHINE CO.'S STOCK ROOM FOR NEEDLES AND SUPPLIES

One feature which has made this company popular with its customers is the promptness with which it fills orders for supply parts. Mr. Nydegger has made it a stringent rule of the office that every order for supply parts, needles and small supplies, shall be filled on the day it is received. In order to do this three men are engaged wholly in keeping up the stock and filling the small orders.

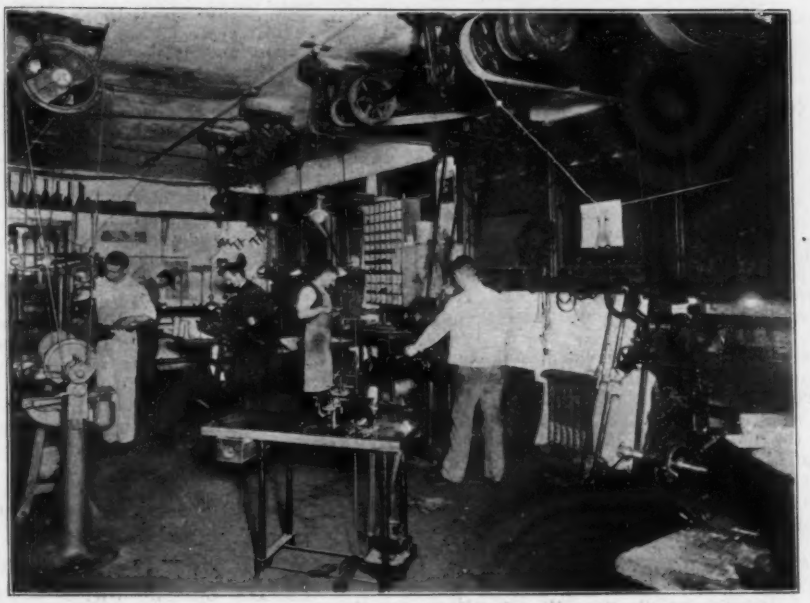
The growth of this business has been steady and it has now assumed a very large volume. We understand for the month of September orders were received for over $150,000 worth of machin-

ery and supplies, which the organization is fully equipped both in the financial and executive departments to fill.

come by them, because he is usually able to offer some helpful suggestions.

The pictures show a general view of the main

GROSSER KNITTING MACHINE CO.'S NEW OFFICES. MAIN OFFICE



ERECTING AND REPAIR ROOM

Mr. Nydegger is a thoroughly practical man himself and his visits to his customers are welcome by them, because he is usually able to offer some helpful suggestions.

The pictures show a general view of the main office, a corner in the needle stock room and the repair shop.

WORKMEN'S COMPENSATION ACTS AND THE AUTOMATIC SPRINKLER

Where workmen's compensation acts have been enacted, every death from fire and every bodily injury from fire to an industrial workman means that the employer must pay compensation. All compensation insurance underwriters recognize this fact and regard it as a serious menace to the surplus of their companies. Recognizing that it is of prime importance to prevent injury, state officials and employers' associations have concentrated their combined energies upon this prevention, with splendid results. Among the most important and most satisfactory and dependable of all measures to meet the particular hazard of death or injury from fire, the automatic sprinkler has been selected as the one element of highest importance.

So far as present records show, there have been to date just eight deaths by fire in properties protected by automatic sprinklers. Five of these were in one fire in a building where the water had been turned off from the sprinklers. The employes were suffocated by a quick fire before water could be again turned into the system. Two deaths occurred in a celluloid factory where the fire was completely put out by the sprinklers after the unfortunate employes had run through the flames. The other case was the explosion of a lantern in the hands of a watchman. His death resulted, but the sprinklers held the fire and prevented the destruction of the building. In none of these cases was the automatic sprinkler at fault. In other words, its record as a fire-fighting and life-saving device is perfectly clear.

KISSELS EXPAND

A steady increase in business has forced the purchase of an additional plant by the Kissel Motor Car Company, thus greatly multiplying the productive capacity of this concern. Following close upon the heels of the announcement that additions have been completed adding 40,000 square feet to the Hartford, Wis., plant of the company, this latest news causes the keenest interest.

The new plant of the Kissel Company is in Milwaukee, corner of Center and 32nd Sts. It is modern, completely equipped and contains some 200,000 square feet of working floor space. It was formerly occupied by the Romadka Trunk Company. The new tenants will take possession at once and expect to have the new plant in operation early in November. The Kissel Company states that the new plant is ideally designed for its needs and that it is quite possible to turn out 10,000 cars a year there. At present it will be used only for assembling purposes, the manufactures of parts being continued at Hartford exclusively. The general offices of the company will be moved to Milwaukee.

The rapid expansion and progress of the Kissel Motor Car Company within the last few years has brought it into unusual prominence. Inside of six years it has risen from a $50,000 corporation into a $1,000,000 concern with a surplus of $500,000 and subsidiary companies in ten states, each operating on additional capital. The entire stock is owned in the Kissel family, George A. Kissel being president and general manager, and William L. Kissel secretary and treasurer.

THE SEYDEL MFG. CO. IN NEW QUARTERS

This well known manufacturer of Sizol, finishing Sizol, softeners and textile soaps, have moved, owing to their increasing business, into very much larger quarters at 86-100 Forrest St., Jersey City. The building occupies a large area of ground with a side track for convenient loading of cars. The laboratory is being outfitted with the most precise and up-to-date utensils known to chemists, and their constant research work keeps them always abreast and often ahead of the times. The factory, or industrial laboratory, is devised to make perfect goods and to make them with as much accuracy as is done in the laboratory. The stock room is large enough to hold a liberal supply of everything that they manufacture and is well stocked with all their staple products.

ELECTRIC POWER

The Shaw Stocking Co., Lowell, Mass., is equipping its plant with electric drive and is installing a 500 k. w. Curtis turbo-generator with 25 k. w. exciter in the power plant. Power will be distributed in the factory by nine motors, ranging from 5 to 50 h. p. All this apparatus is being furnished and installed by the General Electric Company. The Richmond Hosiery Mills, Rossville, Ga., are arranging for electric drive equipment in their mills and are installing twenty motors, ranging from 5 to 50 h. p., with necessary transformers and switchboards. The General Electric Company is supplying this equipment. The Franklin Cotton Mills, Concord, N. C., are adding to their equipment for electric drive eighteen motors of 20 h. p. and one of 50 h. p. These motors are of the General Electric Company manufacture.

The Appleton Co., Boston, Mass., is placing in its Lowell Mills for electric drive three 50 h. p. and seven 100 h. p. motors, which are being obtained from the General Electric Company. The Patrick Duluth Woolen Mills, Duluth, Minn., are being equipped for electric drives. Power will be obtained from the Great Northern Power Company and thirty-two motors, ranging from 3 to 15 h. p., with necessary transformers and switches are being installed throughout the mills. All the electrical apparatus is being supplied by the General Electric Company. The West Point Mfg. Co., Longdale, Ala., is installing a 2000 k. w. Curtis turbo-generator with 25 k. w. turbo-exciter in its power plant. The apparatus is being furnished by the General Electric Company.

CLOSED CROTCH UNION SUIT

The Atlas Underwear Co. of Piqua, O., have been granted a patent for the Richmond Closed Crotch Union Suit, embodying the feature which they have claimed on this construction.

CASSELLA COLORS

We are in receipt of an interesting shade card issued by the Cassella Color Company; this is a thoroughly revised and up-to-date compilation of technical information and data covering the entire field of Immedial colors in their application to loose cotton. The volume is substantially bound in cloth and consists of three pages of descriptive matter, is illuminated with a large number (396) of dyeings, showing the Immedial dyes as self colors and in combination with one another.

Dyers of raw cotton using the Immedial colors will find this shade card of great value on account of the large number of compound shades to select from and the formulas contained, giving the proportions of colors used to produce each shade.

Another card from the same company is one showing a series of 48 shades upon both worsteds and unions shot with artificial silk threads. As artificial silk is playing a most important part in the manufacture of certain classes of striped and shot goods composed of worsteds and unions, calling for a certain line of colors that will show the artificial silk to the best advantage, the card in question, in which the details of the process are given very fully, will prove of great use to the dyer of this line of goods.

The Cassella Color Company has also furnished us with a copy of a new folder showing a class of goods of growing popularity, viz., eolienne, containing eighteen dyeings of this material, with complete dyeing directions. The material is dyed in two baths; in the first, the wool is dyed, while in the second a proper selection of silk dyestuffs is employed, together with a small quantity of acetic acid, in this way producing cross shades which yield fluorescent effects of great sharpness and distinction.

Dyers and manufacturers interested will be able to obtain copies of these cards on application to the Cassella Color Company.

NEW KISSEL MOTOR CAR BUILDINGS

Work in renovating the recently acquired auxiliary plant of the Kissel Motor Car Company at Milwaukee is reported to be progressing rapidly, and it is expected that it will be ready for occupancy within two or three weeks. The improvements and additions to the Kissel plant at Hartford, Wis., are nearly completed and already partly in use. New Kissel Kar service buildings in Chicago and St. Paul are also nearing completion, while the Boston building, handsomely situated on Commonwealth Ave., will have its opening about October 25th. These new facilities will greatly improve the manufacturing and distributing efficiency of the Kissel Company and enable it to meet a marvelously increasing business.

SEVENTY-FIFTH ANNIVERSARY

On the 8th of October, the firm of G. C. Haubold Jr. Ltd. of Chemnitz, Germany, celebrated the seventy-fifth anniversary of the foundation of that house, which was established in 1837 by Carl Gottlieb Haubold, and has since been developed into a large industry for the manufacture of machinery for dyeing, bleaching and finishing machinery.

ANNOUNCEMENT

The Hewes & Phillips Iron Works, builders of Corliss engines, of Newark, N. J., announce that the agency contract between them and the John B. Perkins Co., of Boston, Mass., covering the New England States, expires by limitation on November 1, 1912, and the business in this territory will thereafter be handled directly by the home office.

Their patrons are requested to address all correspondence and inquiries regarding their products, to Newark, N. J.

THE GROWTH OF THE "MILL WHITE IDEA"

As originators of the "Mill White Idea," the U. S. Gutta Percha Paint Company of Providence, R. I., is reaping the business pioneer's reward—a continuously increasing patronage. The company is entitled to much of the credit for convincing textile mills of the absolute need of better sanitary conditions and better light, these being the two points that they emphasize most in their advertising. "Rice's Mill White" not only multiplies the light in the mill, due to its glossy surface that reflects both daylight and artificial light, but also gives a firm, smooth surface to the walls and ceilings, preventing germs from lodging in them, and preventing soot, etc., from adhering to the walls. It is only within the past ten years that the demand for a paint of the character of "Rice's Mill White" has been created. But in that time the U. S. Gutta Percha Paint Company has made secure its position as the originator and leader in the "Mill White" line. The company gives credit to its long, continuous campaign of educational advertising, for nearly all of its business in the textile field, to which it has, until recently, devoted most of its attention. The recent growth of the business has been such that the company is now enlarging its plant to increase its producing facilities.

An order has just been filled for two carloads of "Rice's Mill White," the business being secured in competition with paints of lower first cost. But the contractor knew from his past experience that it would cost less in the end to use "Rice's Mill White" because of the ease with which it can be applied, and the fact that it covers a greater surface with a given quantity of paint than the other products offered.

Regarding an improvement recently made the company says:

"It is an accepted truth that no white can remain permanently white in the absence of sunlight. As an illustration, a sheet of white paper or a linen collar turns to a yellow shade in time. But notwithstanding all this our research department has been working steadily to combat this tendency of yellowing, and we have been rewarded for our efforts to a great extent, in fact, have accomplished even more than we had thought possible. There is nothing in the paint line which at all approaches 'Rice's Mill White' in respect to holding color, and while we do not absolutely guarantee permanence we do guarantee any of our customers that our white will hold white longer than any other gloss white paint used under the same conditions."

FIRE PUT OUT IN FIFTEEN SECONDS

A Practical Demonstration of Automatic Sprinklers

At the water conservation exhibit in the courtyard of the Philadelphia city hall, which started Oct. 14th and will continue about a month, is a most interesting demonstration of automatic sprinklers in operation. Thousands of people, in passing through the city hall or passing along Market St., have been attracted by the novel display, and have watched the demonstration with the greatest interest.

A house of wired glass with steel framework has been erected, as shown by the photograph. At the center of the ceiling is a Grinnell automatic sprinkler, connected by piping through the necessary valves and from there to the city water supply. Underneath this sprinkler a conical structure covered with an asbestos fiber is periodically saturated with alcohol and lighted. It is a matter of but 15 seconds when the sprinkler head fuses and a drenching rain puts out the fire. The novel point about this exhibit is that it gives a visual demonstration to people, who never before have seen anything of the sort, of the power of the automatic sprinkler to both discover a fire and to put it out.

A PRACTICAL DEMONSTRATION OF AUTOMATIC SPRINKLERS

The conservation of water comes in from the fact that the automatic sprinkler, which puts out a fire while it is small, requires immensely less water than does the fire department, attacking the fire after it has gathered headway. The record of the sprinkler covering many thousands of fires shows that in more than half of all cases three sprinklers or less will put the fire out. The water discharged from these is absolutely negligible, compared with the amount which would be used by the fire department if the sprinkler were not on guard.

The exhibit is in the main that of the General Fire Extinguisher Co., Providence, R. I. The building was furnished by the Detroit-Finestra Steel Products Co. It has a Drouve skylight, while Mississippi wired glass has been used for the glazing. All of these materials find a large place in modern fireproof construction, and all are doing their share in cutting down the annual destruction by fire.

LUNKENHEIMER "PUDDLED" SEMI-STEEL VALVES

The increasing use of high pressures and superheated steam has created a demand for something better than the ordinary cast iron, brass mounted valves. To meet this demand, The Lunkenheimer Company are bringing out a line of "puddled" semi-steel valves.

"Puddled" semi-steel is an extremely high grade iron and steel alloy, of very close grain and great strength. The Lunkenheimer method is to melt the iron and steel together in a specially modified "puddling" furnace, thoroughly mixing them during the process, and by pouring off at the proper time and temperature, they secure an invariably uniform alloy. By their process, The Lunkenheimer Company is enabled at will to control the tensile strength at any point between 30,000 and 40,000 pounds per square inch. Ordinarily, the strength maintained is 35,000 pounds, which is over 100 per cent. stronger than the cast iron used in the majority of valves, and about 50 per cent. stronger than that used in Lunkenheimer valves.

Lunkenheimer "Puddled" semi-steel valves have been extensively used in high pressure plants carrying superheated steam, and in other places where the physical demands on a valve are great. The line includes globe, angle, cross, check, gate, non-return safety boiler stop valves, etc. For extreme conditions of pressure, superheat and strain, The Lunkenheimer Company manufacture the above line made of cast steel, the tensile strength of which is about 80,000 pounds per square inch. For lower pressures and temperatures, the line is made of a high grade cast iron. A full description of these valves may be obtained from The Lunkenheimer Company, Cincinnati, O.

A RECORD OF FORTY YEARS

In 1873 Max Lowenthal started in the manufacture of knit goods at Rochester, N. Y., with six hand knitters and one hand spooler, his work rooms occupying a floor space of 1,380 square feet. He began with 24 employes and the yearly output was 2,089 dozen. During the forty years since its establishment the business has grown until the equipment now consists of 125 power ribbers, 15 power spoolers and 105 power machines with floor space amounting to 58,000 square feet. The number employed is 350 and there is a yearly output of 331,150 dozen.

A FIRE PUT OUT BY SPRINKLERS

An evening blaze in the Sterling Mills, Ilion, N. Y., started on the first floor and worked its way to the floors above by following the open belt-shafts. This construction was such that a bad fire was threatened, but twelve Grinnell automatic sprinklers opening from the heat put the fire out.

AN AUSPICIOUS OPENING OF THE PHILADELPHIA TEXTILE SCHOOL

The Philadelphia Textile School opened its twenty-ninth season on September 30th, with the largest enrollment since nineteen hundred and six. While the increase in the number of students taking courses in silk, chemistry and dyeing is the most marked, it is gratifying to find a considerable increase in all courses. Perhaps no higher tribute could be paid to the efficiency of an institution of learning, or to the loyalty of its alumni than is expressed in the statement made by Director E. W. France to the effect that over eighty per cent. of those who have entered the freshman class have done so because of the success and recommendation of some graduate.

The excellent teaching staff has suffered no losses during the past few years, so that when a former student visits the school he sees many familiar faces, in addition to that of Director France, who has been identified with the school's work for over twenty-seven years, and he receives a fresh inspiration of love for alma mater by reason of the general enthusiasm of the faculty, among whom a harmonious endeavor to advance the influence of the school has been the chief aim.

COMPARISON OF HORSE AND MOTOR TRUCK HAULAGE EXPENSE

"It is possible to give a pretty accurate idea of how motor haulage should work out in any man's business," says President George A. Kissel of the Kissel Motor Car Company, "but it of course requires certain information on which to base estimates. Among the inquiries received regarding Kissel Kar motor vehicles, there are a surprising number that ask for estimates of operating cost without giving any detail of the work in which the truck will be used. Now there are general facts of great interest that can be told of the motor wagon to any inquirer, no matter what his business may be, but to give figures and facts that will certainly apply to a particular proposition, the conditions and circumstances of that particular proposition must first be known.

"It is essential to understand where the truck is to be installed—nature of the roads as to hills and paving. Of course the daily delivery distances are necessary to learn, also the average number of stops. Then the nature of the load to be carried becomes important. Are the packages carried large or small—light or bulky? These questions answered all help to give the manufacturer an opportunity to estimate more nearly and clearly. If comparative figures between horse and motor haulage are desired, full information should be forthcoming as to the present horse haulage expense, including wages, feed, repairs, replacements and depreciation."

SPHINX SIZE

For sizing wool and shoddy the Sphinx size, manufactured by The Arabol Mfg. Co., 100 William St., New York City, is of tested and uniform excellence. It is a heavy liquid and easily applied.

AN INDUSTRIAL UNIVERSITY

With the view of securing to all manufacturing interests located at Lomax, Ill., the advantage of being in a position to secure a highly trained class of employees, and to secure for all small industries and generally for the inventors of the United States, an opportunity to develop new manufacturing projects under highly favorable conditions, the Lomax Town Co., proposes to establish at Lomax an institution to be called the Industrial University, having for its object the upbuilding of all industrial establishments to be located there.

It is proposed to organize the institution with a Board of Control composed of highly trained experts in Mechanical Engineering, Electricity, Chemistry, Advertising, and Business Management, with other branches added as the needs of the institution may develop.

Under the management of this Board will be organized:

1. A trade school for the special training in all industrial lines, of all who may desire such training, free of charge.

2. A technical school for higher training in Mechanics, Chemistry, Electricity and Factory Management.

3. An Inventors department for the benefit of all inventors of the United States with undeveloped or partially developed ideas, which may be worthy of the assistance of the institution.

It is proposed to give to any inventor free of charge, if he so desires, such advice as will enable him to make such experiments as will demonstrate the value of the idea, together with an opportunity to work out such idea and the use free of charge of exclusive and private apartments, equipped with all facilities for the development of such invention.

4. An industrial nursery building or buildings designed with the special purpose of providing for all new industries at a minimum cost every advantage in the way of favorable conditions in working space, power, light, heat and shipping facilities, that could be secured by the most modern and fully equipped manufacturing establishment.

In this building or buildings it is intended to install fully equipped foundries, machine shops, and mechanical, chemical and electrical laboratories for the common use of all industries.

The advantage of a cooperative advertising arrangement by which the combined interest developed by this institution would be able to secure the greatest amount of publicity at the least expense under the direction of advertising experts.

The free advice and assistance at all times of the experts of the University on any problems arising in the development of the industries both in a mechanical way or in business management.

5. A department of Research for the benefit of all industries in conducting special investigations to secure improved methods of manufacture and the development of new processes for the benefit of any or all local industries. The use of complete laboratories and facilities offered in the use of specially equipped shops, foundries and testing apparatus will be of immense value to the manufacturer who will not be required to install an expensive laboratory for individual requirements.—The Lomax (Ill.) Herald.

Recent Textile Patents

BRAIDING MACHINE Carrier. 1,041,590. John E. Chace, South Attleboro, Mass.

CLOTH CUTTING Machine. 1,041,341. Erick H. Peterson, Philadelphia, Pa.

CLOTH-STRETCHING Machine. 1,039,281. Melville P. Hayward, Quincy, Mass.

DYEING MACHINE. 1,040,626. William Sackett Duell, Amsterdam, N. Y.

EMBROIDERING MACHINE, Jacquard. 1,040,834. Robert Zahn, Plauen, Germany.

EMBROIDERING MACHINE Protective Device. 1,040,938. Joseph A. Groebli, New York.

KNITTING MACHINE, Circular. 1,040,183. Augustin Gagne, Central Falls, R. I.

KNITTING MACHINE Latch Needle. 1,039,450. Robert W. Scott, Leeds Point, N. J.

KNITTING MACHINE Tension Mechanism. 1,039,989. Joseph D. Morley, Utica, N. Y.

KNITTING MACHNIE, Rib. 1,039,990. Joseph D. Morely, Utica, N. Y.

KNOT-TIER. 1,041,039. John T. Dalton and John C. Daneker, Baltimore, Md.

LOOM. 1,040,778. Robert W. Schrey, Philadelphia, Pa.

LOOM. 1,040,203. Simeon S. Jackson, Readville, Mass.

LOOM. 1,041,254. Frederick Duerrenberger, Paterson, N. J.

LOOMS, Feeler-motion for. 1,040,409. Victor Rainville, Lawrence, Mass.

LOOM for Weaving Gauze. 1,040,184. Ernst K. Geier, Hazleton, Pa.

LOOMS, Automatic Bobbin-changing Device for. 1,041,304. Albert G. Koechlin, Basel, Switzerland.

LOOMS, Locking Device for Filling-detectors of Weft-replenishing. 1,040,985. Eppa H. Ryon, Waltham, Mass.

LOOMS, Pick-finder device for. 1,041,089. Simeon S. Jackson, Readville, Mass.

LOOMS, Pick-finder Device for. 1,040,547. Simeon S. Jackson, Readville, Mass.

SHUTTLE. Hand-threading. 1,039,964. Joseph Lacroix, Fall River, Mass.

SHUTTLE, Weaving. 1,039,435. Edward H. Ottenheimer, Willimantic, Conn.

SPINNING FRAME. 1,041,665. Herbert W. Owne, Dover, N. H.

SPINNING and Doubling Machines, Bearing for Supporting the Fliers and Wherves on the Bolster Tubes of. 1,039,726. Joseph S. Gaunt, Manchester, Eng.

SPINNING RING Holder. 1,040,535. Bicknell Hall, Taunton, Mass.

SPINNING, Twisting and Like Machines, Spindle for. 1,039,433. Albert H. Morton, Lowell, Mass.

SPOOL, Braider. 1,040,384. Frank Mossberg, Attleboro, Mass.

STOP-MOTION to Attach to a Cotton-card, Automatic. 1,041,032. Walter W. Crenshaw, Rockhill, S. C.

SPOOLING or Winding Machine. 1,039,906. Frederick S. Culver, Taunton, Mass.

SPINNING SPINDLE. 1,039,434. Albert H. Morton, Lowell, Mass.

SPINNING FRAMES, Prevention of Double Threads and Intertwining in. 1,040,224. Ivan Linon, Ensival, Belgium.

SPINNING, Twisting and Like Machines, Spindle Support for. 1,040,297. George W. Farnham, Lowell, Mass.

SPINNING MACHINE. 1,039,905. Frederick S. Culver, Taunton, Mass.

THREAD GUIDE. 1,041,655. Arthur A. Merritt, Worcester, Mass.

THREAD GUIDE and Clearer. 1,039,285. Lewis T. Houghton, Worcester, Mass.

THREAD-CLEARING Device. 1,040,087. Edward Woolley, Woonsocket, R. I.

TWISTED CORD or Thread and for Reeling the Same, Automatically-acting Machine for Making a. 1,039,211. Lawrence A. Subers, Cleveland, O.

TWISTING MACHINE. 1,039,876. Isaac L. Wolkow, Louisville, Ky.

WINDING MACHINE. 1,041,157. Charles F. Perham, Lowell, Mass.

YARN-STRIPPER. 1,041,088. William Hurd, Troy, N. Y.

RECENT TEXTILE TRADE-MARKS

62,810. Velvet Ribbons. Mark: Alexida. Owner: Colcombet Fois & Co., St. Etienne, France.

62,811. Velvet Ribbons. Mark: Femina. Owner: Colcombet Fois & Co., St. Etienne, France.

63,380. Hosiery. Mark: Worldbeeter. Owner: Gurdin & Stieglitz, New York.

64,159. Hosiery. Mark: Sutrite. Owner: E. Sutro & Son Co., Philadelphia, Pa.

64,292. Yarn. Mark: Mevsilk. Owner: Jos. Meyer & Co., New York.

64,348. Hosiery. Mark: Scout. Owner: Oneida Regal Textile Co., Philadelphia, Pa.
K. Solomon & Co., Pittsburg, Pa.

63,020. Cotton sheetings. Mark: Foxcroft. Owner: Riverside & Dan River Cotton Mills, Danville, Va.

64,414. Cotton piece goods. Mark: Mulhouse Mills. Owner: Jacob S. Bernheimer & Co. New York.

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